SATELLITE SURVIVAL

Trouble Shooting Guide

Installation Manual

$15.00

Digitized by the Internet Archive
in 2024 with funding from
Amateur Radio Digital Communications, Grant 151

https://archive.org/details/satellitesurviva00kaye

SATELLITE SURVIVAL

PRE-PUBLICATION COPY
NOT FOR SALE

BY GEORGE R. KAYER

COPYRIGHT © 1984 THE BOTTOM LINE. ALL RIGHTS RESERVED

PRINTED IN THE UNITED STATES OF AMERICA.

PHOTOCOPY PERMISSION is granted by The Bottom Line for libraries and others registered with the copyright clearance center (ccc). Copying other than personal use without written permission from The Bottem Line, will put your bottom on the line, besides that it is prohibited.

Waiver of the requirement for specific permission does not extend to complete chapters. Send request for permission to The Bottom Line 2701 West Dunlap Suite 150,. phoenix, Arizona. 85201.

PRE-PUBLICATION COPY
NOT FOR SALE

CONTENTS

PREFACE

ACKNOWLEDGMENTS

GLOSSARY 1–34

SITE SURVEY 35

1 - 1 PROPER FORETHOUGHT

1 - 2 TRUE SOUTH

1 - 3 OBSTRUCTIONS OF HEIGHT

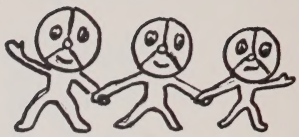
1 - 4 TELEPHONE AND POWER POLES

1 - 5 MICROWAVE TOWERS

1 - 6 MILITARY BASES

1 - 7 HEAVY SNOW FALL

1 - 8 AMERICAS YARDS



THE FEED SYSTEM 40

2 - 1 NON ADJUSTABLE FEED

2 - 2 ADJUSTABLE FEED 3 OR 4 LEG TYPE

2 - 3 ADJUSTABLE FEED BOTTON HOOK TYPE

2 - 4 NOTES AND REMINDERS

THE 10 K COAX RUN 44

3 - 1 YOUR PREFERENCE

3 - 2 NO GUN

3 - 3 IN THE TRENCHES

3 - 4 DON'T BURY ME YET

3 - 5 UP UP AND AWAY

3 - 6 WALL FISH

3 - 7 MAKING CONNECTIONS

3 - 8 F CONNECTORS

3 - 9 MORE THAN ONE RECEIVER

POURING THE PAD 52

4 - 1 TOOLS YOU MAY NEED

4 - 2 LETS START

4 - 3 THATS GOOD ENOUGH

4 - 4 POLE FOUNDATION NORMAL

4 - 5 POLE FOUNDATION SANDY

4 - 6 POLE FOUNDATION ROCKY

4 - 7 POLE FOUNDATION PAD TYPE

4 - 8 POLE FOUNDATION PORTABLE

4 - 9 CHECK POINT

PRE-PUBLICATION COPY
NOT FOR SALE

PUTTING THE DISH TOGETHER 57

5 - 1 THE FIRST TIP

5 - 2 EXTRA CLIPS

5 - 3 PATIENTS

5 - 4 OLE PIN TRICK

5 - 5 GETTING IT UP

6 - 1 A DEFINITION OF EASY

6 - 2 CHANNELS FOR TRACKING

6 - 3 PROGRAMMABLE RECEIVERS

6 - 4 WEATHER PERMITTING

6 - 5 CHECK POINT

6 - 6 HOOKED UP

6 - 7 TRACKING WITHOUT A COMPASS

6 - 8 DECLINATION

6 - 9 ELEVATION

6 - 10 TUNING THE ZENITH

6 - 11 TRACKING

6 - 12 REMINDER

6 - 13 TRACKING WITH A COMPASS

6 - 14 DECLINATION

6 - 15 ELEVATION

6 - 16 TRACKING AND TUNING

6 - 17 REMINDER

AIMING THE DISH CONT.

6 - 18 NO COMPASS - NO INCLINOMETER

6 - 19 WHERE AM I, SITE COORDINATES

WINTER-SUMMER 70

7 - 1 DON'T BE LAZY

7 - 2 WINTER CONCRETE

7 - 3 GROUND PREPERATION

THE GAMBLE 72

8 - 1 LIGHTNING

ROOF MOUNTS 73

9 - 1 ROOF MOUNTS INSURANCE

9 - 2 SURVEY

9 - 3 RESPECT YOUR ROOF

HIGH POLE MOUNTS 75

11 - 1 HIGH POLES

11 - 2 OFF BALANCE

11 - 3 SURVEY

11 - 4 FLUSH OR OFFSET

11 - 5 SOFFIT OR NO SOFFIT

11 - 6 POLE LENGTH AND TABS

11 - 7 CHECK POINT

11 - 8 INSTALLING THE POLE

11 - 9 POLE FISHING

11 - 10 ACTUATOR NOW OR LATER

11 - 11 SUCURING THE POLE

11 - 12 SUCURING THE POLE BLOCK WALL

11 - 13 GUY WIRE INSTALLATION

TROUBLE SHOOTING 87

12 - 1 AFFLICTIONS, AILMENTS, AND TREATMENTS

12 - 11 NOTES AND REMINDERS

TERRESTIAL INTERFERENCE 93

13 - 1 T WHAT ??

13 - 2 THE UNTRAINED EYE

13 - 3 TESTING FOR TI

13 - 4 STRENGTH AND DIRECTION

13 - 5 TROUBLE SHOOTING TI

13 - 6 BUILDING A TI SCREEN

OTHER PUBLICATIONS 100

PREFACE

This manual may seem elementary to many, as it is designed for people who have little or no knowledge of home TVRO's. This is not a highly technical manual for experienced dealers. SATELLITE SURVIVAL is devoted to single family home installations and is the most complete guide availible to the general puplic. Subjects such as history, programing, and component choices will not be found in SATELLITE SURVIVAL. Comparisons of systems is not the object here, getting them to work is.

As I stumbled through learning about this wonderful industry I found it difficult to find specifics in any sufficient quanity. Then there are always those who assumed I knew what they were talking about. Any notification of assumption on my part is welcome.

The satellite industry is just starting to set standards, proper wind load and weather studies are only now becoming a concern to the majority of manufacturers as well as consumers. The installation recomendations in this manual may exceed some local recomendations, but I would much rather be safe than two or three thousand dollars worth of sorry.

If you have a problem that has the best of you please let us know, we may have an answer for you.

ACKNOWLEDGMENTS

Few works have ever come between two covers without the help of friends and associates. Each of these people have had an influence on this work.

EDWARD ETZKIN	The satellite Store
PETER FOTI	High Frontier Distribution
SHARON FORTNER	International Video Communications
SCOTT HOPSON	For the Artwork
JOHN JONES	The Satellite Store
STEVE MASTERSON	
JEFF MORIARTY	International Communications Systems
JOHN NAISBITT	Author of Megatrends
ROD NEFF	Continental Satellite Systems
DERELL WRIGHT	The Satellite Store

Without the tremendous efforts of the individuals that comprise the following companies, this industry would not be where it is today. Thank you.

COOP'S DIGEST	S T V MAGIZINE
SATELLITE DEALER MAGIZINE	SATELLITE TV OPPORTUNITIES
THE WORLD OF SATELLITE TELEVISION	

PRE-PUBLICATION COPY
NOT FOR SALE

GLOSSARY

A/B SWITCH

A switch to enable one to change from satellite T V to regular T V without disconnecting one or the other. also see channel combiner.

AC - AC CURRENT

An abreviation for alternating current, better known as the plug in the wall that delivers 110 volts AC.

ACTUATOR

This is one of the terms that has many aliases in the satellite industy. Also known as antenna positioner, motor drive, antenna motor drive. Basically this is a motor that drives the dish from one end of the clark belt to the other. This enables one to choose one of the many satellites available from the comfort of your living room.

ACTUATOR BOOT

A protective cover over the actuator motor. Located outside on the dish.

ACTUATOR BRAIN

The part of the actuator that is in the house which allows you to control the movement of the dish.

A F C. Automatic Frequency Controll. This system or curcit allows the receiver to lock on to a signal, preventing receiver drift.

ALIGNMENT

Alignment or tuning in the antenna either before, during or after the installation, manually or remotely. Also the tuning of a component before it leaves the manufacture.

A

AMPLIFIER, DISTRIBUTION

To increase the Db gain either before or after reaching the receiver to increase the audio or video signal. To be distributed to many receivers or TV's.

AMPLIFIER, IN LINE

Used or spliced between the coaxial cable between the receiver and the dish, normally outside. To increase the quallity of the audio or video signal

ANGLE FINDER — See inclinometer.

ANTENNA POSITIONER — See actuator.

APATURE

Equals the diameter of the parabolic antenna.

APATURE EFFICIENCY

Is the ratio of the signal versus the radical maximum for a given dish and feed system combination. A good system operates about 50% efficient.

A R C. — Refers to the clark belt.

A R O.

Audio receive only. Radio stations use these to receive news or sports cast for rebroadcasting.

A S C. — Authorized Service Center.

AUDIO ENCODING

To incode or scramble the audio signal from the satellite. To prevent unauthorized reception.

AUDIO SUBCARRIERS

The part of the system that carries the audio from the satellite. It is important to know that there can be many audio subcarriers transmitted along with one video frequency. These do not interfere with the regular TV programs. To receive the many FM music stations choose a receiver capable of receiving additional audio subcarriers.

A W G. American Wire Guage.

AZIMUTH

The true geographic direction given in degrees clockwise from geographic north. Also a term used to describe the east west movement of the polar mount.

PRE-PUBLICATION COPY
NOT FOR SALE

BAND-PASS FILTER

A device used in multiple receiver installations. A filter that will enable you to use an off air channel, like channel 3, it only lets channel 3 pass preventing channel 2 or 4 from interfering.

BANDWIDTH

If a component opperates on a bandwidth 500 MHz, an example would be from 450 MHz to 950 MHz = a 500 MHz bandwidth. The narrower the bandwidth usually would indicate a strogner signal. The garden hose principal.

BASE BAND An unmodulated signal from the satellite.

B

BATTERY BACK UP

Most digital programable receivers are equiped with battery back up to preserve the programming in case of power failure. Be sure that the installation crew or yourself put the batteries in the receiver.

BIRD

Slang for satellite.

BLACK BOX

A term used for decoder. Purchased under the counter or from somewhere other than the company authorized to sell them.

BLIZZARD

A term used to describe strong interference. So many sparklies you cannot make out an image on the TV screen.

BLOCK DOWN CONVERSION

A down converter is a component that reduces the frequency of a received signal. Block down conver sion does this step with the whole satellite frequency, consisting of a 500 MHz wide block, containing all 12 channels of a given polarity.

BLOWN FUSE

Usually indicated by a broken wire (element) inside the fuse, sometimes a color change can be noted.

BOTTON HOOK

Used to describe a method of mounting the feed system.

BRAIN See actuator brain

BREAKING

In reference to an actuator this would refer to the time it takes the actuator to stop, from the time you push the button inside the house untill it stops. Will the component break accurately without having to fine tune?

BUG COVER

Used to cover the throat of the polar rotor as you may have guessed, so the bugs don't watch the picture before you do.

CABLE See coaxial cable

CARRIER A radio signalmodulated to transmit information.

C A T V TRANSFORMER

An adaptor that allows you to go from the coaxial cable to the VHF screws on your TV. If your TV has a cable input you will not need one of these.

C - BAND

The slang designation given to dome sats or domestic satellites transmitting at 3.7 to 4.2 gigahertz.

CHANNEL COMBINER

Unlike an A/B switch that must be manually operated this unit has an input for your regular TV and an input for satellite TV and an output to the TV that continually sends the satellite signal to an off air channel, such as channel 3 or 4.

C

CIRCULAR POLARIZATION

Another way of polarizing the signal, mainly used in international satellites.

CLARK BELT

This term comes from Arthur C. Clarke, a science fiction writer. The Clarke belt is 22,300 miles above the equator. It is a geostationary orbit, or a parking place for satellites. This enables us to receive the satellite signal without some kind of continous motion or tracking from our earth stations.

C/N OR C/NR OR S/NR

An abreviation for carrier noise ratio or signal noise ratio. The ratio of signal to noise strength usually measured in dB gain.

COAXIAL CABLE

Like many items in the satellite industry, one could write a chapter on coaxial cable. RG-6 and RG-59 are the main cables used by the industry. RG-6 is the better of the two, with less signal loss. Flooded cable is for underground use and ariel cable for overhead use.

COAXIAL SEAL

This is a very important part of the installation procedure. When you do not seal the connections on the LNA the downconverter and any line amplifiers your system will go off the air as soon as any moisture gets into it. If your dealer has not provided you with coaxial seal, then a good substitute is PVC pipe cement. Apply this liberally.

COMPUTER INFORMATION SERVICES

These are services that are someway intergrated between satellite transmissions and computer. More information on the subject may be found in computer periodicals.

CONCRETE PAD

A slab of concrete above and/or below the ground. Used as an anchor or base for the satellite system as a whole.

CONTINUITY

Consistant, a continuity check will tell you if that coaxial cable is good enough to bury. Used to detect short circuts, cuts or breaks.

CRIMP TOOL

A tool used for crimping or securing the connectors on the coaxial cable. This tool may be obtained at any Radio Shack or K-Mart store.

CROSS EYE FEEDS

Uaually referring to 3 or more LNA's on a spherical antenna normally used in commercial applications to receive three or more satellites at one time.

DECIBLE OR dB

A term used to determine the strength of an incomming signal.

D

D B S. OR DIRECT BROADCAST SATELLITE

These satellites operate on a frequency of 11.7 to 12.7 gigahertz Also known as the K band or Ku band.

D C BLOCK

A component used to block the D C power from going to the LNA or downconverter. Normally used in multiple receiver installations.

D C POWER

An electric current that flows in one direction only. As in 9 volt batteries, 12 volt batteries.

DECLINATION

The offset angle between the polar axis and the dish. This allows the dish to track the entire clark belt with only one azimuth adjustment.

DECODER

See black box.

DEMODULATE

A process that recovers information from a radio frequency carrier.

DETENT TUNNING

There are three basic types of tunning knobs on a receiver. One is like a FM radio, smoth when tuning it. The second is push button. The third like your television, it clicks when you turn it. This is called detent tunning.

DIGITAL

1. The use of numbers expressed in digits that lite up.
2. A digital circuit that operates as a switch either hi/low or on/off.

DIRECT BURIAL

Refers to flooded coaxial cable. May be buried direct without other forms of protection.

DOMESTIC SATELLITE

A satellite that was designed and built to serve the North American Continent.

DISCRETE

A way in which an audio subcarrier is transmitted. This method used two separate subcarriers. One for the left channel and another for the right channel. also see matrix or multiplex.

DISCRIMINATOR

The circuit that separated the audio and the vidio from the IF signal. This process normally takes place in the receiver.

DISH See parabolic antenna.

DOME SAT Slang for domestic satellite.

DOWN CONVERTER

Often called a DC. A device that lowers the frequency of the signal from microwave to IF.

DOWN LINK Same as TVRO.

DUAL CONVERSION

A process that better systems use. This process uses two steps to convert 4 gig microwave to IF.

DUAL FEED

Referring to the feed system. A dual feed will have 2 LNA's enabling the system to receive both polarities at once. All 24 channels without changing polarity.

EARTH STATION

Refers to the complete TVRO system, the dish, polar mount, LNA, receiver, wireand cable.

EAST COAST FEED

Satellite programs specificately programmed to air on Eastern Standard Time.

EB/NO Energy bit to noise power ratio.

E C S. European communication satellites.

E D. Energy disbursal.

EIRP EFFECTIVE ISOTROPHIC RADIATED POWER

A measurement of relative power from the satellite signal as it is measured on earth.

ELEVATION

Measured in degrees, the angle above the horizon the dish must be aimed to receive a signal from a satellite.

EYE BOLT

Used in roof mounts and high poles to secure guy wires.

F CONNECTOR OR F FITTING

These connectors go on the cable that runs from the downconverter to the receiver. They come in two basic sizes, RG-6 and RG-59.

F/D OR F TO D RATIO

The focal length to diameter ratio of a dish.

FEED

The round object that feeds the reflected signal from the dish into the LNA. Another name for a polar rotor.

FREE TECHNICAL COPY NOT FOR SALE

FEED ASSEMBLY

That part that holds the feed or polar rotor away from the dish usually called LNA legs or button hook pole.

FEED HORN Same as feed or polar rotor.

FEED LINE

A term given to the coaxial cable running from the dish to the receiver. This includes all 4 gig and IF cable, (70 MHz line).

FEED SYSTEM

Consisting of the feed horn, LNA, feed line, and feed assembly.

FLURRIES

A term used to describe medium interference. You can still see the image on the screen even though there is a large amount of sparklies.

F-G

FOCAL FINDER

An object used by satellite stores or installation crews to get the correct focal length of the dish. There cost usually prohibit a one time use.

FOCAL LENGTH

The exact distance the feed horn has to be from the dish.

FOCAL POINT

A point in front of the dish where the maximum reflected signal is located.

FOOTPRINT

The area of the earth that a particular satellite or transponder is aimedat. Also see hot spot.

FREQUENCY

Cycles per second. One thousand megacycles = one gig or gigahertz.

FREQUENCY AGILE

Describes a receiver that will pick up all 24 satellite channels on a given satellite.

FUSE

Located in receivers and acuator brains to protect circuits from damage caused by accidental overloads, or short circuits.

G/T

Gain to noise temperature ratio. the larger the G/T the better the picture. A primary discription of the performance from a complete satellite system.

GAIN

To amplify an input. The difference of the input and output is measured in dB's and referd to as gain. (10 dB gain)

GEOSTATIONARY ORBIT

An orbit stationary only with respect to the earths surface.

GEOSYNCHRONOUS

An orbit synchronized with the earths rotation.

G F C I — Ground fault circuit interupter.

GHz — Gigahertz.

GIG — Gigahertz.

H D T V — High definition television.

HEAT TAPE

Used in cold climates to protect things from freezing.

H P A — High power amplifier.

H-I

HOT SPOT

Refers to the most powerful signal area within a particular footprint.

HUM BARS

Horizontal fuzz or bars that move slowly through the picture.

I F Intermediate frequency.

INCLINOMETER

Used during a site survey to determine a clear path from the site to the satellites. Aso used to achive proper elevation.

INFERED REMOTE

About the most common form of remote control used for short distances. common on TV's and other audio components. Also see UHF remote.

INTELSAT Short for International Satellite.

INVERT

An economical way to scramble a satellite signal. Most receivers have a invert switch on the back.

ISOLATOR

Used in multiple installations to prevent unwanted signal from interfering with the desierd signal. Also used to isolate a voltage.

J BOLT

A special purpose fastener, sometimes used in roof mounts.

K - DEGREES KELVIN

As in 70 degree LNA. The lower the temperature the less noise. The lower the noise the better the picture.

Ku BAND

Ku band satellites desingnate a transmission in the 11.7 to 12.7 gigahertz range, see D B S.

L N A Low noise ampliefier.

L N A BOOSTER

Another term for a 4 gigahertz amplifier. Used in cases where the downconverter must be located inside a building and demanding a long RG-213 cable run from the dish to a building. A rare case for a home owner.

L N A COVER

A simple plastic or metal cover to protect the LNA, and feed horn from the weather.

L N B

Low noise block down converter. A product that combines the LNA and block downconverter in one unit.

L N C

Low noise converter. The LNA and a downconverter are combined in one unit.

L-M

LATITUDE ADJUSMENT See elevation.

LATITUDE/LONGITUDE

Latitude, angular distance, measured in degrees North or South from the equator.

Longitude, angular distance East or West on the earth's surface, measured by the angle (expressed in degrees up to 180 in either direction)

LOOK ANGLE

The exact angle or elevation the dish needs to be in order to look at a particular satellite.

MA BELLS See TI.

MAIN LOBE

The main part of the signal that strikes the face or front of the dish. See side lobe.

MAGNETIC DEVIATION

The difference between the true geographical poles and the magnetic poles. The difference is measured in degrees.

MASONARY BOLT

Made in many forms, but all work on the same principle As the bolt is tightened, the shell around it expands and grips the inside of the hole.

MATRIX

Matrix will use two different subcarriers, one carrying the left plus the right channels, and one carrying the left minus the right.

M A T V Master antenna television.

M B See T I or Ma Bell's

MICROWAVE

A wave less than one meter in length. As communication knowledge has increased the usable spectrum has expanded to higher frequencys. 1000 MHz = 1 gig and can be considerd the beginning of the microwave spectrum. Some solid state devices now operate well above 100,000 gigs Beyond this comes the infared or heat region. Light visible to the human eye ranges from about 275,000 red, to 790,000 gigs being violet. Microwave ovens operate at around 2½ gigs.

MINUTES As in latitude and longitude. See (6-21)

MODULATION

A radio or satellite receiver can be tuned to the carrier frequency of a radio or satellite transmitter but will produce no sound from this carrier. However, if such an inaudible carrier wave is made to vary at speech or musical tone rates it is said to be modulated by the speech or music. At this point the radio or receiver can demodulate the modulation on the carrier, thus producing speech or music.

M-N

MODULATOR OUTPUT

In reference to a satellite receiver, the output would refer to the channel the manufacturer recomended. Usually channel 3 or 4.

MOLLY BOLT

Similar to a toggle bolt and should not be used in place of a masonry bolt. The molly is designed for attaching to hollow surfaces.

MONITOR

For the video perfectionest a monitor will give studio quality as long as the system is preforming properly.

MOTOIZED ANTENNA ACTUATOR OR POSITIONER. See actuator

MULTIPLEX

Both right and left channels are transmitted on one subcarrier.

N CONNECTOR

If you are using an RG-213 in the system these connectors are already on the cable. If not the other option is to use a male to male N connector.
Connecting the downconverter directly to the LNA eliminating any signal loss between the two.

NOISE

The better the quality of each component in the system the less noise each will produce. Noise (as used here) is something you see, not hear. Noise will show up as white or black sparklies on the TV screen.

NOISE FIGURE

Referring to LNA's, they may be measured in degrees kelvin or dB's. The most widely used and understood is in degrees kelvin. From 50 (best) to 120 (fair)

NOISE RATIO See S N R.

NOISE TEMPERATURE See noise figure.

NOTCH FILTER

A type of T I filter made to remove a specific frequency of interference.

OFFSET ANGLE See declination.

OHM

Ohmage- the electrical resistance of a conductor, expressed in ohms. The unit of measurement of resistance.

OHMMETER

An instrument used for measuring electrical resistance in ohms. A cable run should have no measurable resistance

O T S Obital test satellite.

OVERDRIVE

To put too much signal, too much power. To overpower the signal.

P

PANNING

Not for gold but for satellites. To move the dish East and West or North and South looking for a satellite. Trying to track.

PARABOLIC ANTENNA

Usually wok shaped, so named because of the parabolic curve that reflects all of the signal to the focal point.

PARENTAL LOCKOUT

A feature on more advanced programable type receivers or actuators, enabling one to lock out a particular channel or satellite.

PATCH CORD

A short length of coaxial cable used to patch or connect the receiver to the TV, VCR, etc., etc.

P L L

Phase lock loop. An electronic procedure to remove the wanted audio and video from a 70 MHz IF signal.

POLAR MOUNT

A polar mount combines the azimuth (East-West movement) and the elevation (up-down movement) adjustments. This allows us to track the clark belt with what appears to be a singal East or West movement.

POLAR ROTOR

Once the dish has done its job of reflecting the signal to the focal point the polar rotor collects the signal, delivering it to the LNA.

POLAR ROTOR CONTROL

A switch to choose either positive or negative polarity. Vertical or horizontal.

POLARITY

There are four kinds of polarity. Horizontal, vertical, left hand circular and right hand circular. Our concern is with horizontal and vertical. In order to transmitt 24 channels on a 12 channel satellite, they polarize it. Half being horizontal and the other half being vertical. The polar rotor lets only one polarity at a time pass through the waveguide in the LNA.

POLARIZATION

See polarity

POSITION ANGLE

See look angle

PRE-PUBLICATION COPY
NOT FOR SALE

POWER DIVIDER

An example would be to use a power devider to supply power to 2 LNA's from one downconverter or receiver.

PRIME FOCUS

The most popular by comparison, it is easier to aim accurately.

PROTRACTOR

May be used in place of inclinometer for site surveys and setting the look angle.

QUICK CONNECT

A connector that pushes on instead of screwing on.

RECEIVER DRIFT

Receiver drift can be noted by the constant need to adjust the channel selector or fine tune the receiver every 10 to 30 minutes.

REFLECTOR See parabolic antenna.

RELAY MAP

A map indicating the paths and locations of microwave towers.

RELAY STATIONS Microwave transmitters.

REMOTE SENSOR

The sensor that picks up the signal from the remote control. Usually located on either the receiver or the actuator.

REPEATERS Microwave tranceivers

R F Radio frequency.

RG - 213 OR 214

A short piece of coaxial cable, up to say 15 feet long. Also called 4 gig cable or microwave cable because it carries the 4 gig signal from the LNA to the DC.

RUN

As in the cable run. So far the maximum standard length to receive with the system is 100 to 125 feet. This is plenty to accomodate the average (run) installation.

SATTELLITE That which retransmitts the uplink signal.

SATELLITE RECEIVER

This is the component that sits on the TV and seems to do all the magic.

SATELLITE TRANSPONDER

That part of the satellite that receives the signal from the uplink then transmitts it back over a portion of the earth.

SCAN

This is a function found on most receivers. it is very helpfull when trying to locate a satellite. See (6-4)

SCRAMBLE To encode a transmission from a satellite.

SCREEN See T I screen.

SHORT

Short circuit, something touching that is not supposed to touch. See ohmmeter

SIDE LOBE Unwanted signal.

SIDELOBE INTERFERENCE

The degree that the antenna amplifies unwanted signals. Thus degrading the picture quality.

S

SIDE LOBE REJECTION

How well a particular antenna will reject an unwanted signal.

SIGNAL COMBINER

Used in commercial SMATV systems to combine X amount of receivers and or local channels into one main cable.

SIGNAL LOSS

Any time a signal travels in and out of components or through cable there will be signal loss.

SIGNAL STRENGTH METER

(SSM) May be a needle or LED located on the receiver to give you a relative indication of the strength of the signal.

SILICONE SEAL

A substitute for coaxial seal. See coaxial seal.

SITE COORDINATES

Your exact location on earth measured by degrees and minutes, latitude and longitude.

SITE SURVEY

To survey a particular location for obstructions that may prevent acceptable performance by the TVRO system.

SKEW

To slant or adjust.

SKY NOISE

Radiation in outerspace that can have an effect on a satellite system.

SMATV

Satellite Master Antenna Television. A privately owned mini cagle system for hotels, mobile home parks, etc.

SN / SNR Signal to noise ratio

SNOW

White dots or sparklies in the picture caused by the system being out of tune, or external interference.

SOLAR CELLS

A device that changes sun light to electricity, thus providing power for the satellite.

SOLAR OUTAGE

The sun's orbit passes exactly behind the satellites twice each year causing interference for about twenty minutes.

SPACE

The Society for Private and Commercial Earth Stations. The only organization representing the home owner in Washington D.C.

SPARKLIES See Snow

SPHERICAL ANTENNA

Antennas that are capable of receiving more than one satellite at a time. Some of these antennas can receive eight or more satellites at once.

S-T

SPLITTERS

Used for hooking up more than one TV or receiver. Used anywhere it is necessary to run a cable in two different directions.

STEREO PROCESSOR

This is one of many add on accessories available. This unit plugs into an auxiliary input of a stereo to give you true stereo for most of the movie channels and many FM stations which are broad cast on satellite.

STOVE BOLTS

Made with slotted round, flat or oval heads. They have coarse threads. Originally used in stove construction, they are now sold as genersl utility bolts.

SUBCARRIER See audio subcarrier.

SUNSPOTS See solar outage

SURGE PROTECTOR

This beauty is so simple yet so important. It will help protect your investment from being fried by lightning or a power surge from the local utility Co.

SUPERSTATIONS

A television station with an uplink for the purpose of rebroadcasting to cable, home satellite and SMATV viewers. (WTBS, WGN, WOR.)

T I

Terrestial Interference, See 13-1. Just hope you never have to be concerned about these two letters of the alphabet.

T I SCREEN

Wire mesh like on the old wood screen doors. Not nylon mesh. Used to block T I.

TAPS

If you have ever noticed a green or brown box or a pedestal in a front yard, this is what is under the cover Taps are used as a splitter for 4, 6, or more houses.

TERMINATOR

Used in multiple installations, example main cable to 5 way splitter, 4 cables out to 4 TV's terminate the fifth output.

TEST PATTERN

A test pattern is normally shown whenever the transponder is in use, but no particular program is being shown. Information sometimes shown on a test pattern will include the upcomming program, when it will be shown and the owner of that particular transponder.

THRESHOLD

To do with receivers, the lower the better. The amount of signal needed for a particular receiver to produce a quality picture.

THRESHOLD EXTENSION

An excellent feature for a receiver, especialy when using a small dish. Threshold extension allows you to lower the receivers threshold, thus producing the best possible picture with a weak signal and/or small dish.

T M T Transcontinental microwave transmitters.

TOGGLE BOLTS Used for fastening to hollow objects.

TRACKER See actuator.

TRANSFORMER

Makes a voltage or resistance higher or lower depending on the need.

TRANSMITTER

The apparatus that converts sound or speech into electric impulses for transmissions known as radio waves.

TRANSPONDER

That part of the satellite that transmits. Channel 7 would be the same as transponder 7.

TRAP Another term for T I filter.

TRUNK LINE

The main line, the one that carries all. Used in commercial cable systems.

TUNNING METER See signal strength meter.

TUNNING VOLTAGE

The voltage sent by the receiver to the downconverter. Each different voltage will cause the downconverter to send a different channel back to the receiver.

TURNKEY SYSTEM

A complete TVRO system installed ready to view.

TURNBUCKLE

Used to raise or lower the elevation on the dish.

T T C — Telementry, tracking control.

TWELVE VOLT SYSTEM

There are sevral receivers on the market that are easy to convert to 12 volt, check with your local dealer.

TWO CONDUCTOR

Two seperate wires each enclosed in plastic then twisted together on one spool.

PRE-PUBLICATION COPY NOT FOR SALE

U H F — Ultra high frequency. 470 to 885 MHz.

U H F REMOTE

The advantage to UHF remote is that it is not line of sight as is infrared remote. With the equipment hooked up properly, you may control your system from any room in the house.

UNDERDRIVE

Not enough signal, gain or power reaching the receiver.

UPLINK

1. Where the satellite signal originates from.
2. The equipment that sends the original signal.
3. A television station that originates a signal for satellite may also be referd to as an uplink.

V

V C O OR V T O

Voltage controlled oscillator, also known as VTO a voltage tuned oscillator.

V H F

Very high frequency 174 to210 MHz. Used to transmit TV as we knew it yesteryear.

VIA SATELLITE A satellite direct or indirect signal.

VIDEO

Designating the picture phase of a television or closed curcuit broadcast. As distinguished from the audio portion.

VIDEO BLACK DETECTOR

A device used to detect the fade to black before each commercial, also known as distinguished from the audio portion.

VIDEO CONTROLL CENTER

For those of us having as many wires inbetween our walls as in them, this unit can help uncomplicate the selection of any one of our components.

VIDEO PROCESSER

This little box of magic will replace those agravating sparklies with a similar color being viewed.

VIDEO MONITOR See monitor.

WAVEGUIDE

That part between the polar rotor and the LNA used to guide the microwaves into the LNA.

WEST COAST FEED

Satellite programs specificately programed to air on Mountain Standard Time usually three hours later than the East coast feed.

WIND LOAD

The load, pressure, or weight the wind puts on the antenna, A major consideration for high pole or roof mounts

WIPE OUT A term used to describe extremly strong T I.

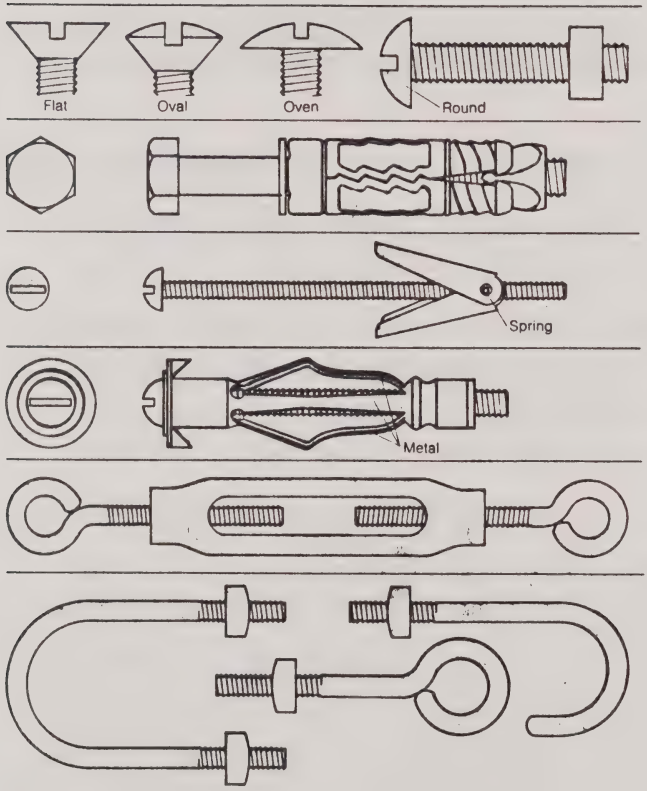
WIRELESS REMOTE

Almost every remote controlled component today is wireless No wire between you and the component you wish to control .

ZENITH

The upper most elevation on the Clarke belt.

SIGNAL COMBINER



STOVE BOLTS

MASONRY BOLT

TOGGLE BOLTS

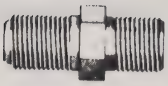
MOLLY BOLT

TURNBUCKLE

U BOLT J BOLT
EYE BOLT

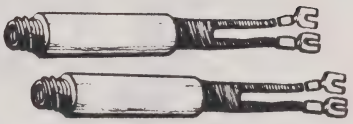
ONE PIECE F
CONNECTOR

TWO PIECE F
CONNECTOR

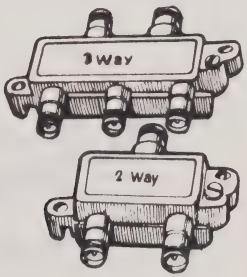


N CONNECTOR

MALE TO MALE
N CONNECTOR



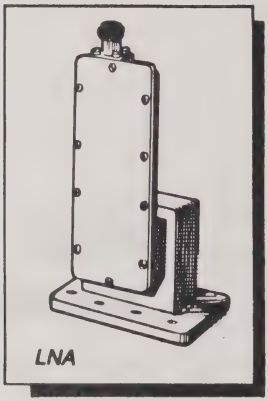
MATCHING TRANSFORMERS



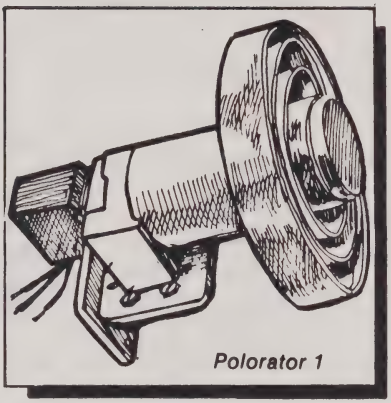
SPLITTERS

JUMPER CABLE OR LEAD

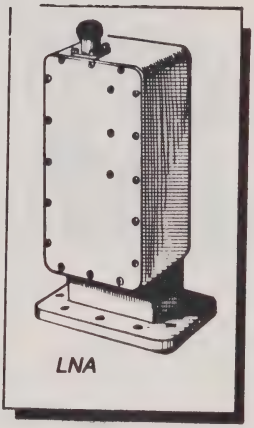
CRIMP TOOL



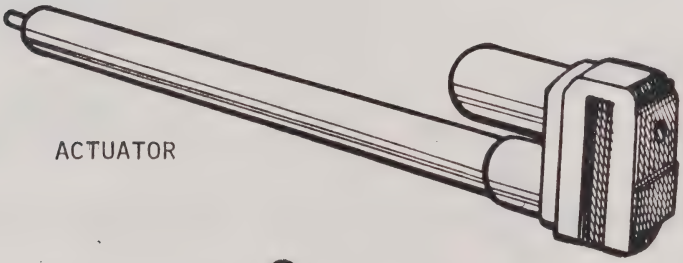
LNA



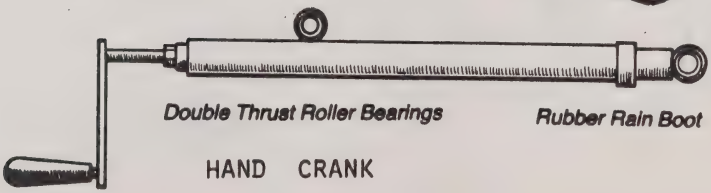
Polorator 1



LNA



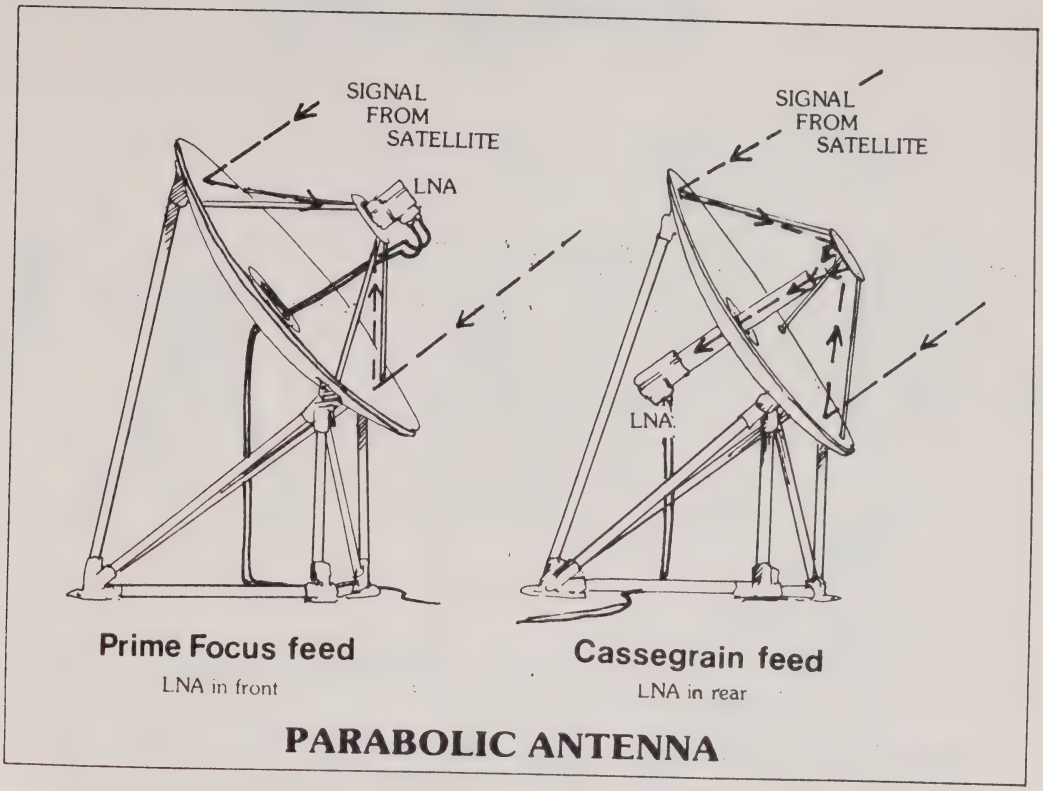
ACTUATOR



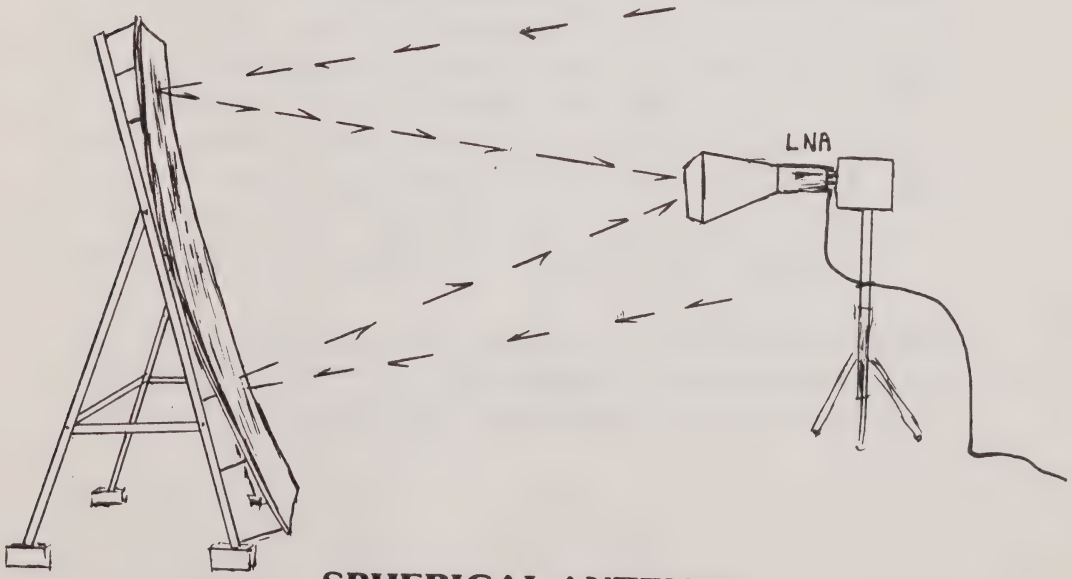
Double Thrust Roller Bearings

Rubber Rain Boot

HAND CRANK



PARABOLIC ANTENNA



SPHERICAL ANTENNA

SITE SURVEY

PRE-PUBLICATION COPY
NOT FOR SALE

1 - 1 Proper Forethought

The proper forethought at this stage of the game will indeed save you from having to move the dish tomarrow. The purpose of the site survey is obtaining the best possible reception, be it winter, spring, summer or fall.
Next face South on the exact location you would like your new antenna. Now look carefully for obstructions, such as trees, fences, nearby houses, telephone or power poles, clothes lines, large trucks, future construction, falling leaves from trees, also be awear of the soil conditions, frost line, millatary bases, and microwave towers.

The list of obstruction is numerous, thus proper forethought will hopefully save you from having to move the dish. Below is a list of the obstructions and some possible remedies.

1 - 2 True South

The next step is to determin South. True South if you are planning to use a compass. True South is South plus or minus the magnetic deviation. If your location is West of zero degrees longitude (10 w) subtract the deviation, If the deviation is East of zero degrees add the deviation. Several readings should be taken to avoid a metal content in the ground or rebar in a block fence. Please, no metal belt buckles. The magnetic deviation may be obtained from (6-21)

Now that we know where South is and what to look for it should be fairly easy.
There are many home systems that do not receive all of the satellites. Sometimes you have to take what you can get because of a tree or some other obstruction.
What the heck! I would rather have fifty or seventy five channels than none at all.

Ok, so you say, I can not find any place the dish will fit. Or your wife says, if that thing go's anywhere in the backyard so do you! What now? It's called a roof mount.

1 - 3 Obstructions of Height

Trees, Fences, Houses, Trucks, Future Construction. These are all obstructions of height.

The basic formula for obstructions of height (for a latitude of 33 degrees) Given a 10 foot high block wall and a dish with a diameter of 8 feet, the dish needs to be the height of the obstruction (10feet) plus half the diameter of the dish (4 feet) for a total of 14 feet away from the block wall.
For a latitude of 40 degrees the dish needs to be double the height away plus half the diameter of the dish. Total of 24 feet.
For a latitude of 46 degrees the dish needs to be triple the height away plus half the diameter of the dish. A total of 34 feet.

1 - 4 Telephone and Power Poles

It is rare that a standard wood pole will present any problem. I have personally placed such a pole containing a fairly large set of transformers directly between the dish and Satcom 4 with no problem. I would not recomend this with the large 600 kv towers. Although I have seen plenty of TVRO systems work fine around these high power towers.

1 - 5 Microwave Towers

Talk about a monster! if you live in the country and have seen one of these monsters lurking about it would be worth a look to tell wheather or not your paths may cross, most of the time they will not.

1 - 5 Microwave Towers Cont.

In order to have your signal eaten by the monster your dish must be directly in the path of its signal. Some dealers have maps or charts showing Ma Bells path of destruction. However most dealers that have been in the business for a while have a good idea where problem areas exist. If by chance you do have one of these monsters aimed right at you I strongly recommend you have a qualified dealer out to set up a portable dish in the exact location you have chosen for the dish. This service usually runs around $100.^{00}$

1 - 6 Milatary Bases

You didn't really want a satellite dish, you did??? Be prepard for a test of patience and some additional expense. Wheather you or your dealer do the installation.

Ok, Ok, but first have a qualified dealer bring a portable unit out with T I filters, shielded cable, and plenty of T I screen. There is some new test equipment out that will save a lot of time and trouble for everyone concernd. Unless your particular dealer is providing this service free try to be sure he brings the items mentiond, without it there is absolutly no way he can tell you what you are paying to find out! Do not be lazy, walk out to the test site and look at the television. Ask the man is this the best picture availible? You are the only one who can decide wheather or not the quality meets your standards.

Under these conditions (T I areas) you may or may not get a picture, you may receive 8 or 9 channels out of 24 on Galaxy 1 and none on W-4 anything is possible in this kind of situation.

1 - 7 Heavy Snow Fall and Leaves

These two elements are not usually a problem in most parts of the United States. Two exceptions do exist, one being heavy snow fall areas, in which case a heat tape with a switch inside is a necessary luxury in the winter. Simply attach two to three heat tapes on the bottom 2/3 of the dish. Owners of mesh type dishes may want to consider installing extra wire ties to prevent any sagging. The other exception is for those of us who have placed the dish under and around trees and shrubs, that shed in the fall. We now have three options. 1. A broom 2. A dish cover. or 3. Move the dish.

1 - 8 Americas Yards

As you probably have noticed, Americas yards are filling up. Rv's pools, trees, and so and so. Most of the time it is possible to locate the dish in the back yard, even if you have to look over a two story house. On the other hand if you have plenty of space, careful thought may be in order. You may want to keep the dish on the outer edge of the property, after all it is, just an antenna.

THE FEED SYSTEM

For the pupose of simplicity there are two kinds of feeds adjustable and non adjustable.

2 - 1 Non Adjustable Feed

These are much easier to set up, sparing the individual the hassel of aligning the focal length. All that should be necessary is to follow the instruction, bolt on the feed system, providing the focal length is included in the instructions, whip out the tape measure and verify that it is right.

PRE-EXISTING COPY NOT FOR SALE

2 - 2 Aligning an Adjustable Feed 3 or 4 legs

For those who have the adjustable type it is most important to align the polar rotor to the exact manufacturer specifications. For dishes with a hole in the center, the old string method is very effective. Once you have the feed system secrure and at the proper focal length, attach two strings across the top of the dish. Then peek through the back of the dish (fig 2-5 is what you should see) If you do not, adjust the feed accordingly.
Depending on your system it may be a good idea to do this after the mount is on but before you put the dish on the pole Here again this procedure depends on the type of mount you are using. The polar member of the mount might interfere with seeing the polar rotor from the back of the dish.

2 - 2 Aligning an Adjustable Feed 3 or 4 legs Cont.

If that is the case, drill any holes and complete all prep work so you will not have to disturb the feed system when connecting the mount.

2 - 3 Aligning an Adjustable Button Hook

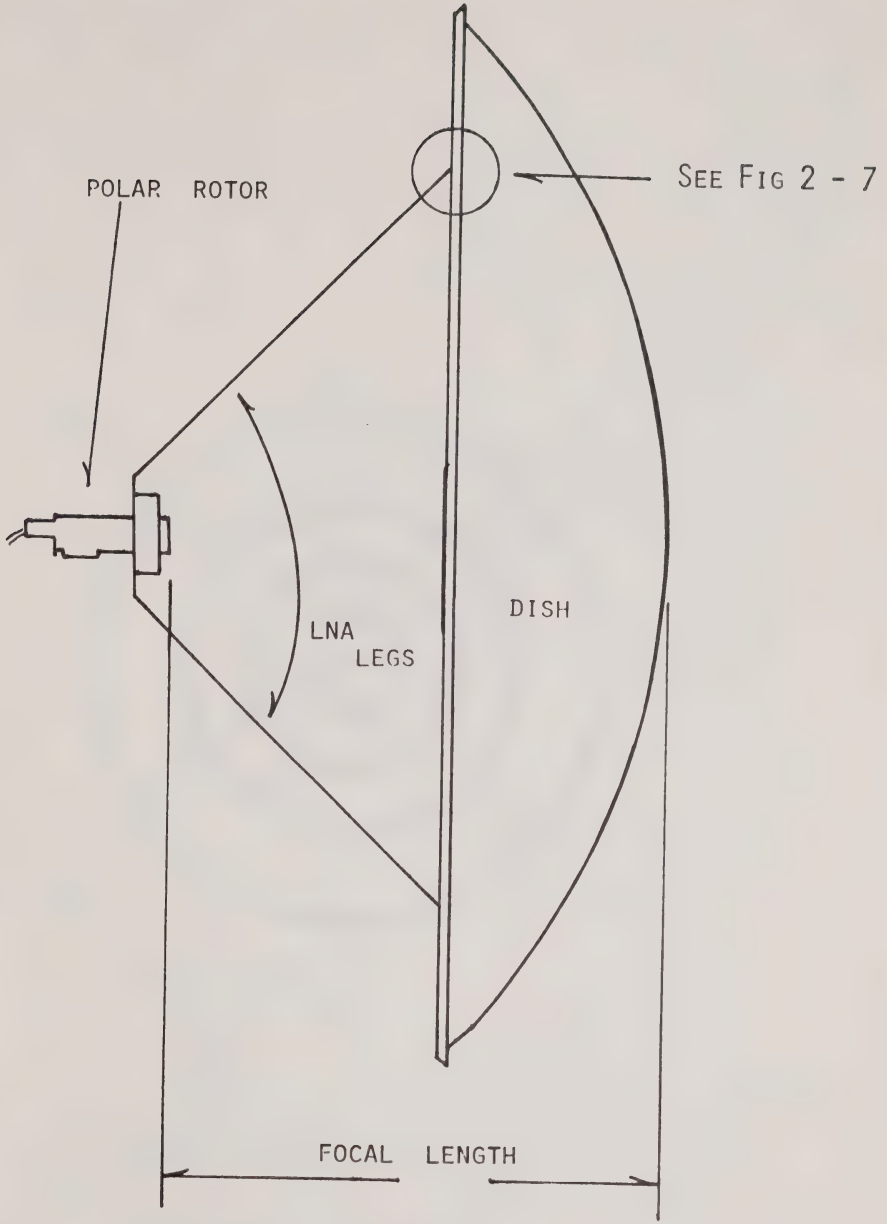
The button hook is probably the easiest type of feed to install and adjust. Simply attach the polar rotor to the LNA then carefully slide the wires through the tube of the button hook. Next insert the tube through the hole in the dish, wires first.

2 - 4 Notes and Reminders

You may test, or set the polar rotor probe to vertical by ueing a 9 volt battery. Just touch the two wires to the two terminals on the battery.
Usually all the wires meet at some point on the ground pole, in order to properly fine tune the system you will need access to the polar rotor wires. After you have made the splice, run the polar rotor wires with the RG-213 cable securing where necessary untill you reach the ground pole or DC. Be sure to leave enough length to reach the work table where the receiver will be.

Do not apply coax or silicone seal to any of the connections at this time. The stuff is a real mess if you have to remove it for one reason or another.

When attaching the LNA to the polar rotor DO NOT USE any type of sealant between these two components. Use only the gasket provided.


POLAR ROTOR
SEE FIG 2 - 7
LNA
LEGS
DISH
FOCAL LENGTH

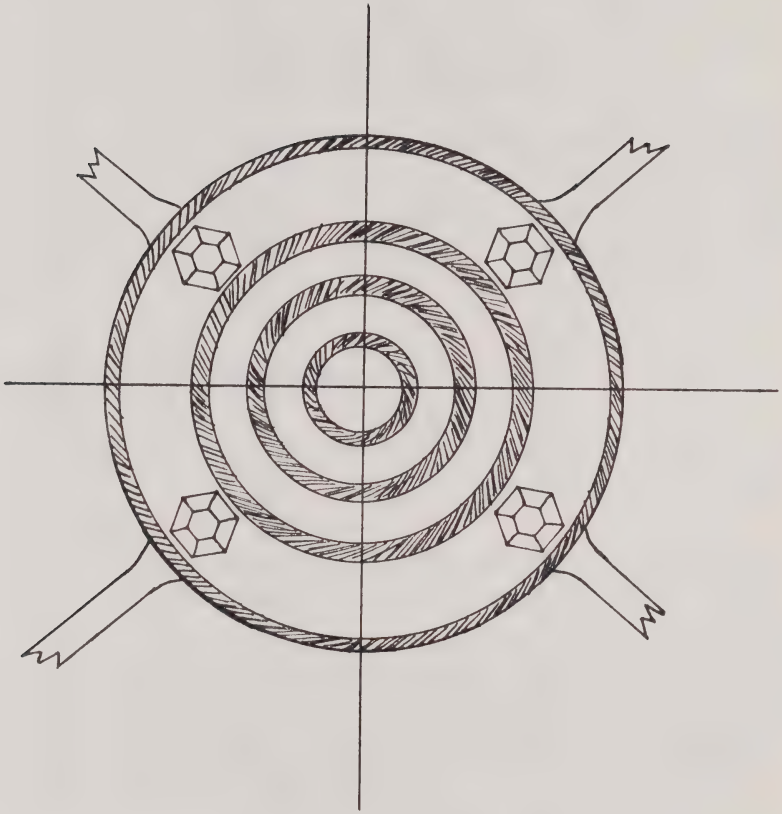
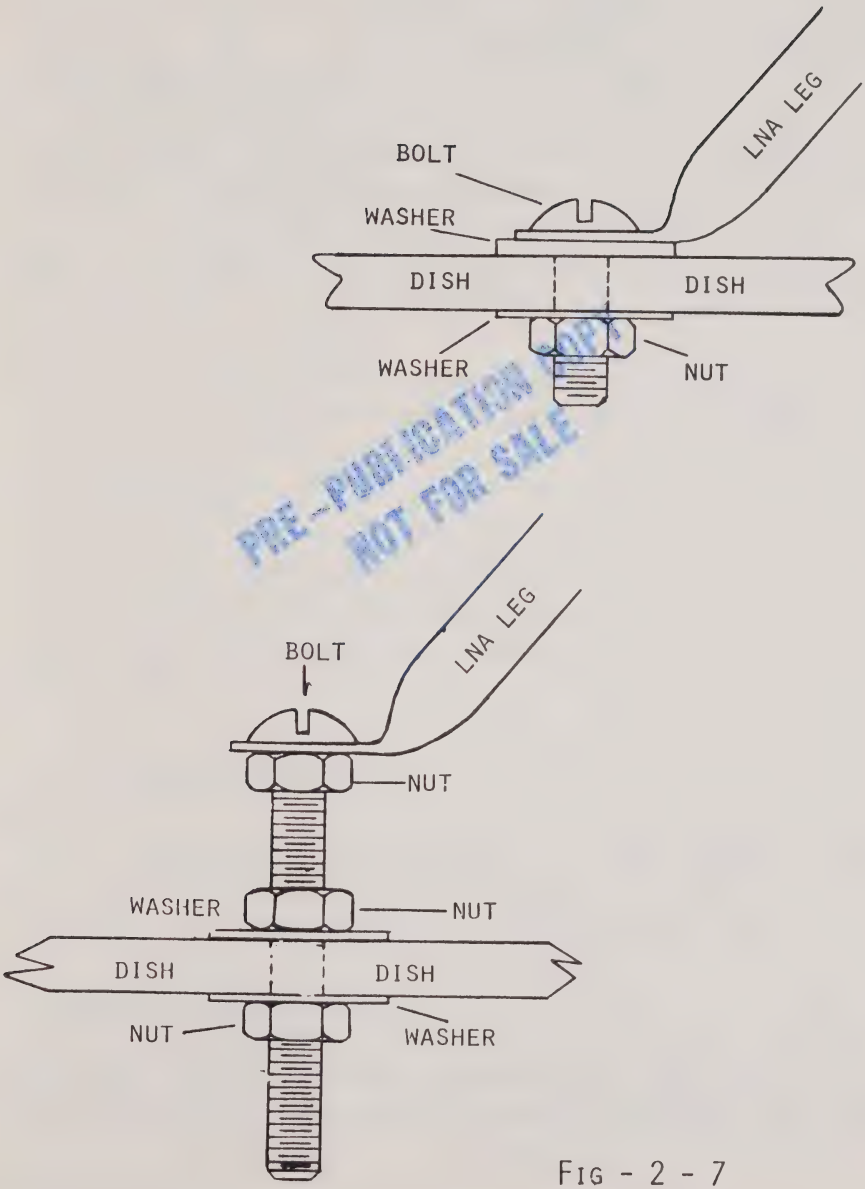


FIG 2 - 5

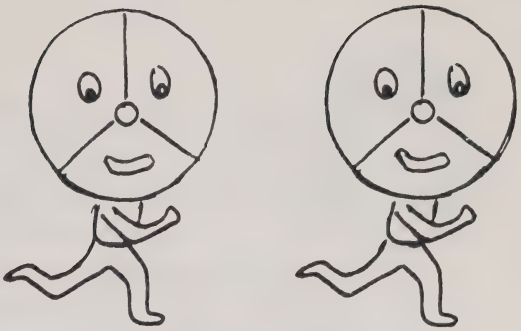
NOTE: DO NOT TOUCH THE PROBE INSIDE THE POLAR ROTOR.



PRE-PUBLICATION COPY
NOT FOR SALE

FIG - 2 - 7

THE 10 K COAX RUN



3 - 1 Your Preference

It is totally your preference as well as your potential problem if you use unprotected cables. Unprotected cables refer to cable left unburied, cable not placed in PVC, cable not properly secured to the ground pole or house. It may also refer to the type of cable being used, be sure to specify the type wanted.
For the ultimate protection bury the cable in PVC from the dish, flush to the point the cable enters the house.

3 - 2 No Guns

Avoid using a staple gun, it is to easy to staple the cable, demanding a splice and reconnect which will cause a small amount of signal loss. A better method is the use of cable clips (fig 3-11)

3 - 3 In The Trenches

Caution Be careful when digging! Do not puncture other lines. The trench for the cable should be 4 to 6 inches deep. In extreamly cold areas be sure it is below the frost line

3 - 4 Don't Bury Me Yet

Unless you have an ohm meter to verify the continuity of the cable do not bury the cable untill all is working picture perfect.

There may be a slight overkill to all these procedures but if you ever have a problem with your system you can lay odds that it is not in the cable!

3 - 5 Up Up and Away

Be sure to drill at least 6 inches above the top plate for entry to the attic. normally 8½ to 9 feet above ground level. It is a good practice to secure the coax to the beams or rafters as a safety precaution, if not for neatness. Entry into the attic is usually found in the garage, bedroom or a closet.

3 - 6 Fishin Around

When the desired location for the satellite components is an inside wall (fig 3-13) one must bring the cable from the dish to the attic, down the inside of the wall creating a neat access in the desired location. Once the cable is pulled into the attic locate the proper wall by having someone inside tap at the top of the wall. Now that you have located the proper wall have your helper tap directly above the location of the desired outlet. Now drill a 1 inch hole through the top plate (the 2x4) at the same time your helper can make a 1½x 2½ inch hole in the wall at the exact place you want the cable to come out. Now you may start feeding the cable through the hole you drilled (if there is more than one cable tape the ends together and then tape about every 12 inches for 3 feet, your helper should be able to get hold of the cable to pull it through. If you are using a multi cable or more then one cable you may have to enlarge the hole in the wall plate (fig 3-12) Also be sure to put the cables through the wall plate before you put the connectors on the cable.

3 - 7 Connections

The addition of resistance to an electric circuit reduces the amount of current that can flow. Loose or oxidized (rusted) electrical connections may act as resistances and often result in improper operation of a circuit. When epuipment is constructed or repaired, the individual must make sure that all connections are finger tight with low resistance.

When a wire is scraped clean and looped around a screw and is tightened, a good, low resistance connection is made between the wire and the screw. The looped end should be fitted snugly around the screw (fig 3-14) in such a direction that the thightening of the screw tends to close the loop rather than open it.

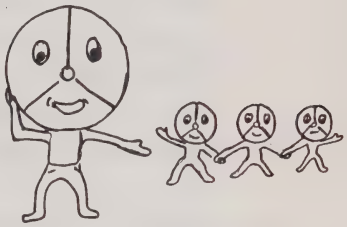
Two wires may be twisted tightly together, as in a Western Union splice (fig 3-15) However. over a period of time such wires may corrode and a resistance can result. To prevent this and to give added strength, the splice may be covered with a protective layer of solder.

3 - 8 Installing F Connectors

The best lesson is to have your dealer take a moment and show you how to properly put on an F connector. If you happen to miss this luxury. read on. The type of F connector may be a one piece or two piece, if there is a ring or barrel included with the connectors, then you know they are two pieces. Trim or strip the coax as shown in (fig 3-16) using the two piece place the barrel on the coax now. Then push the connector on the coax insuring a tight fit.

3 - 8 Installing F Connectors Cont.

Next (one piece crimp now) Two piece slide the barrel up against the connector and crimp.



3 - 9 Multiple Receivers

This section will contain only the basics as this is a subject that can get extreamely complicated.

2 TV's 1 Receiver

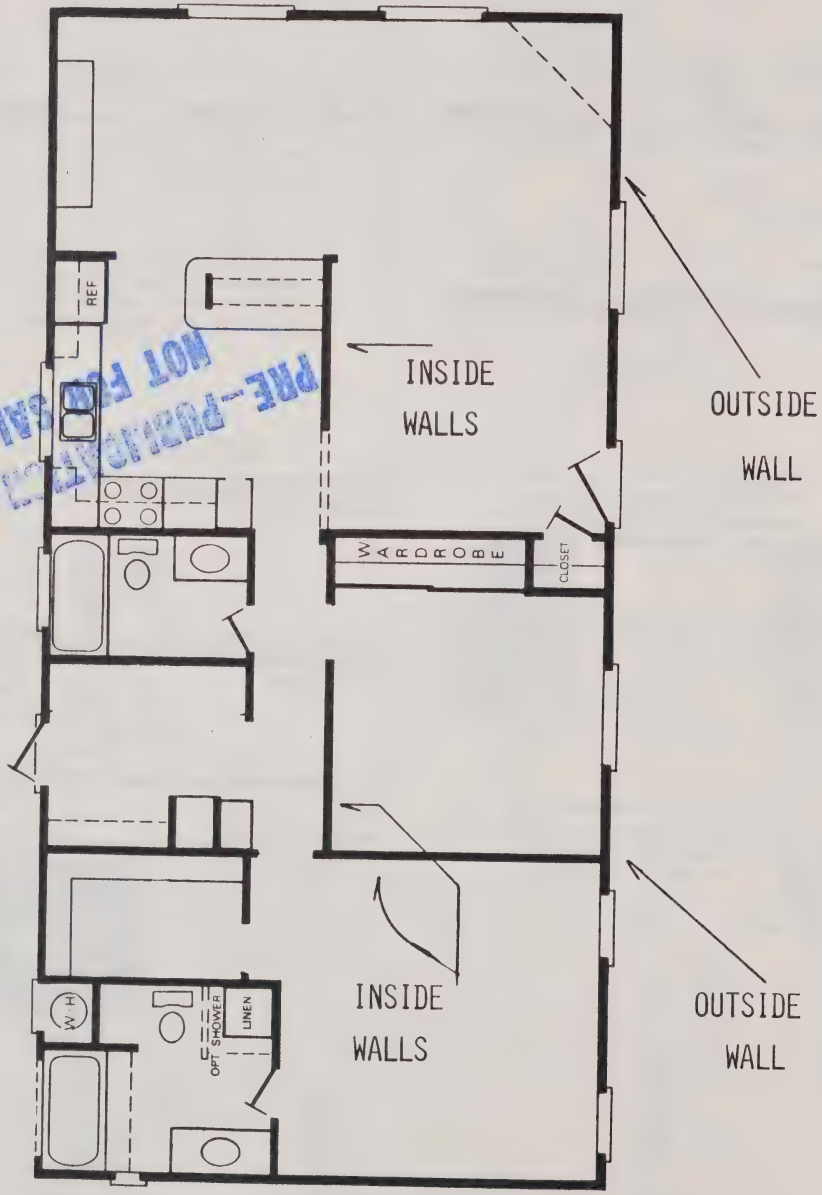
The 2nd TV will show whatever channel the main receiver is tuned to. Fig 3-13 shows the cable from the downconverter to the receiver, out of the receiver and into the splitter, out of the splitter to the 2 TV's. In the case of a wall fish you will need to run another cable from the splitter up the wall across the attic, and then down the wall to the TV.

2 TV's 2 Receivers

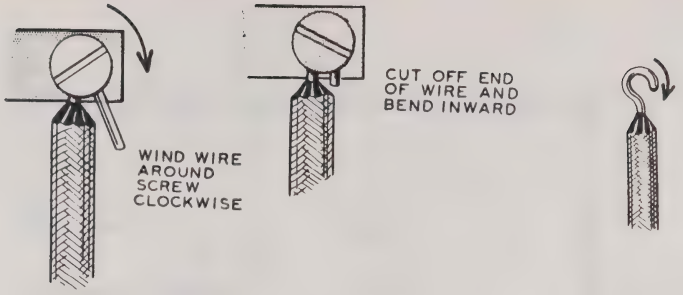
12 channels on each TV, both on the same polarity. Run the main line from the dish into a splitter, out of the splitter to as many receivers as you wish. (fig 3-14)

2 Antennas

Regardless of the amount of TV's or receivers you may add the convience of a signal combiner to your system. This unit allows you to watch regular TV without the hassel of an A-B switch or physicly connecting or disconnecting the cables. (fig 3-14)



PRE-PUBLICATION COPY
NOT FOR SALE



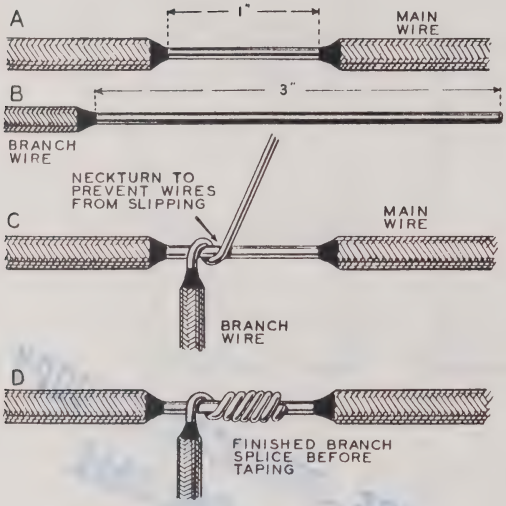
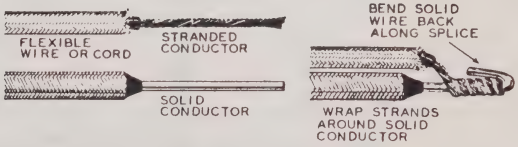
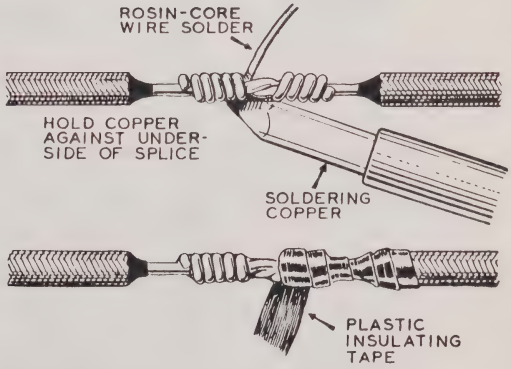


Illustration at left is of a branch, or tap splice, which is used to join a branch wire to a main wire. Note distances.

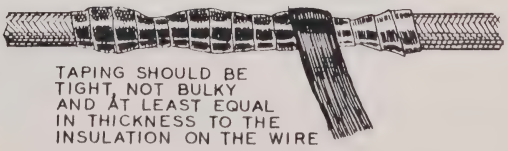


Above, a drawing of a pigtail splice for a fixture. Compare with the pigtail splice on page 3987, note differences.

Below: Never cut insulation from a wire with the knife blade held at a right angle. Hold it angled as indicated.



All splices in wires should be soldered and taped. At right are three illustrations of the proper way to do it.



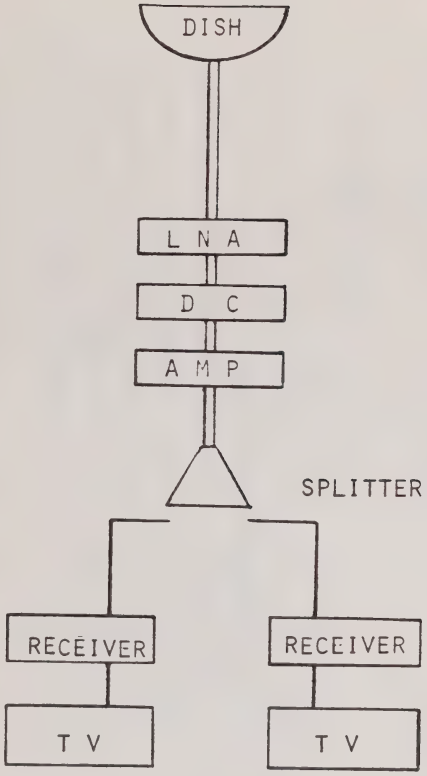
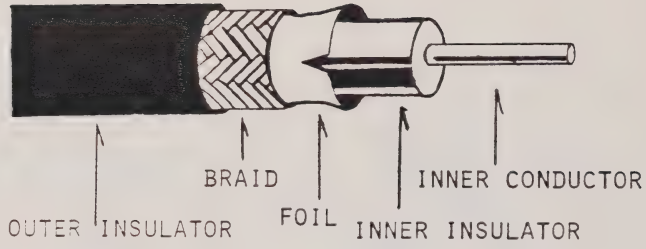
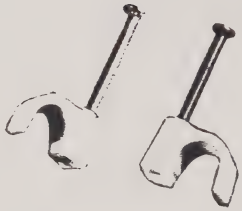


FIG 3 - 13



READY FOR "F" FITTING



High impact plastic cable clips. Pre-installed cadmium plated steel nails will drive into wood, plaster, brick mortar or concrete block

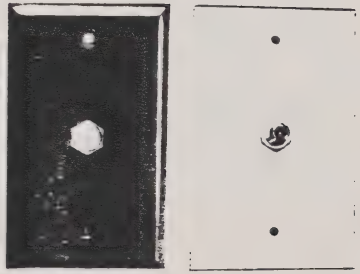
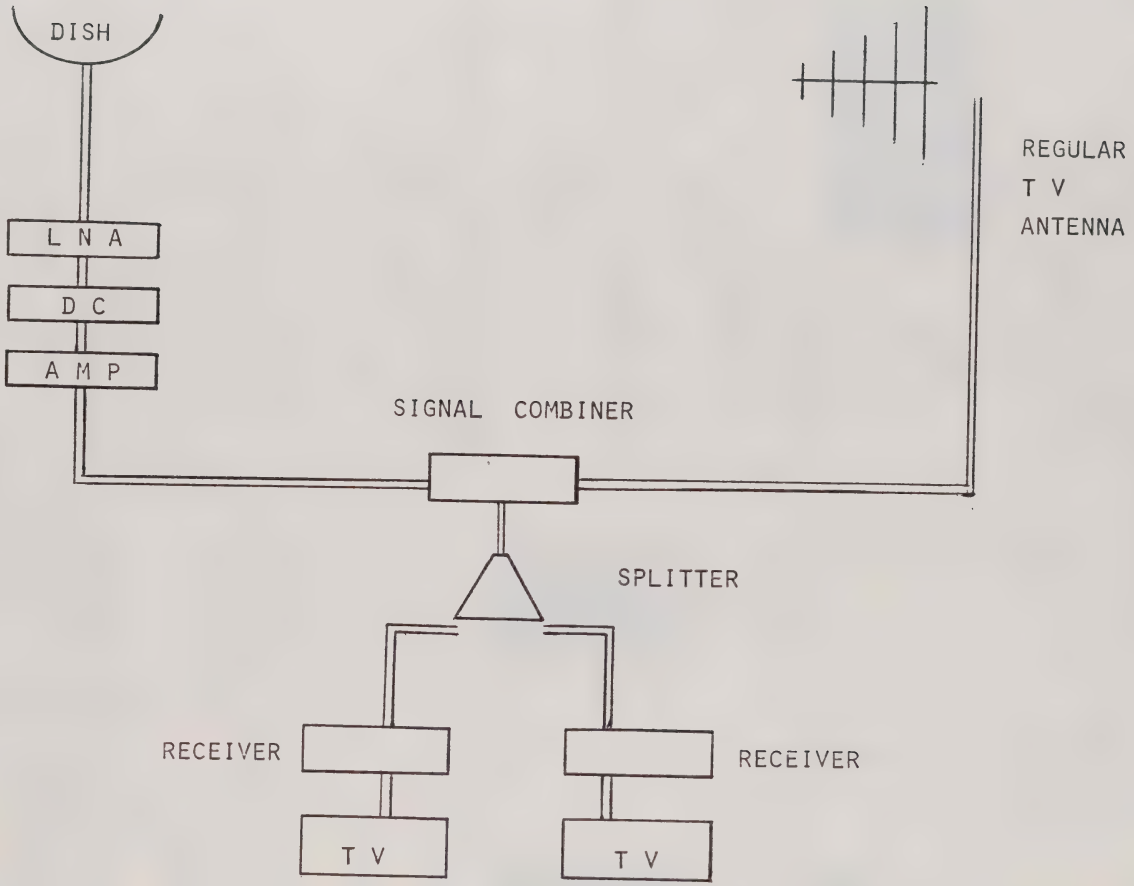
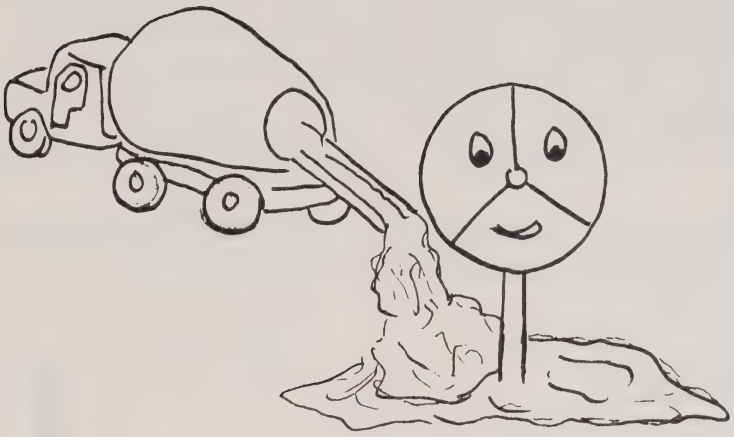


FIG 3 - 11


DISH
L N A
D C
A M P
REGULAR
T V
ANTENNA
SIGNAL COMBINER
SPLITTER
RECEIVER
RECEIVER
T V
T V

POURING THE PAD



4 - 1 Tools

It is just not practical to list all the different tools needed to put together all the different systems. The three main tools most people lack are 1. a compass 2. a carpenters level. 3. an inclinometer or protractor.

4 - 2 Lets Start

Lets start by bringing the equipment out to the site. You will need, 4 to 8 90# bags of redymix, shovel, wheel barrow, water hose, or bucket to haul water from a nearby stream, (yes I have) carpenters level or plumb bob. Preferbly a level as this is a critical part of the installation. In the event your pole is off the slightest, it will be next to impossible to track the dish.

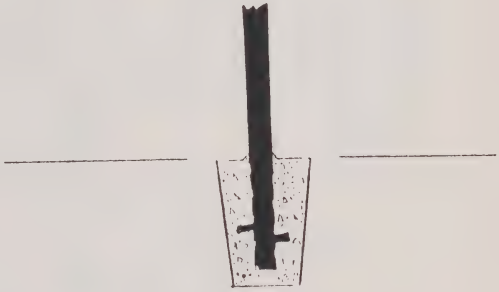
4 - 3 Thats Good Enough

I know how it is when you are outside with a shovel, whether it is 118 or 20 below. You look at that hole and at the shovel and back at the hole, it is very easy to say thats good enough. Well say it anywhere but here! If a storm blows over your dish, the insurance company could term a shallow hole as negligent. Don't be Lazy!!

Now refer to the diagrams of the foundations, choose the one that most resembles your situation.

4 - 4 Normal

This is a standard foundation for most installations.
1½ X 1½ X 3 feet deep.

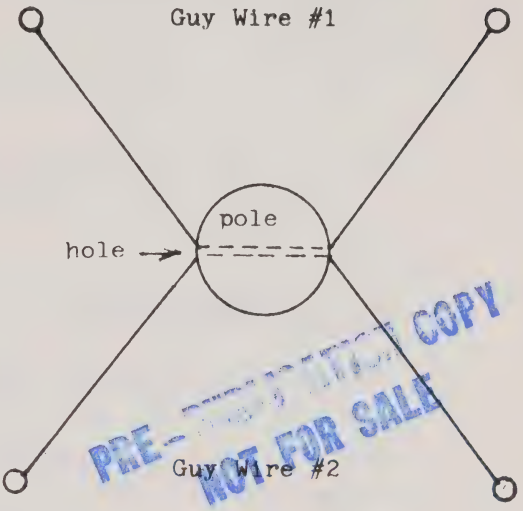


4 - 5 Sandy

Minimum of 4 feet deep.

4 - 6 Very Rocky Ground / High Water Table

Pad size should be a minimum of 2½ feet wide X 2½ feet long X 2½ feet high. Tabs should be as long as possible, a minimum of 18 in. Let the concrete cure then install the guy wires (fig 4-7) Drill the holes just below the yoke or true So. member and run the wires through and to the four stakes.



PRE-PRODUCTION COPY
NOT FOR SALE

Fig 4 - 7

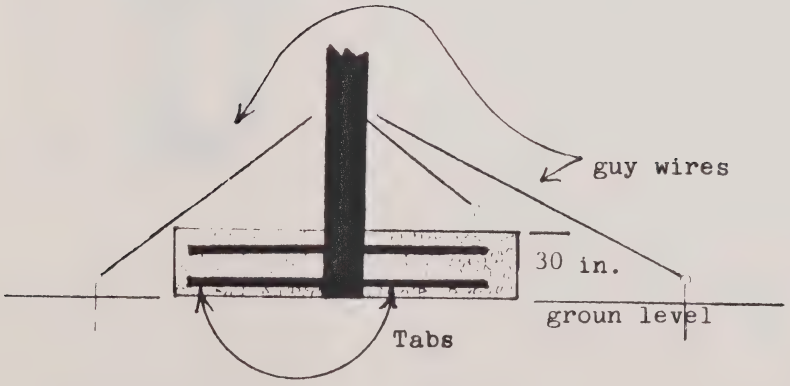
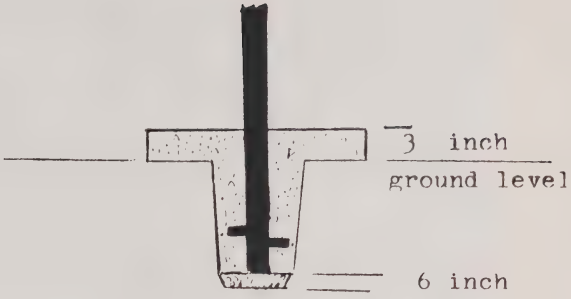


Fig 4 - 6

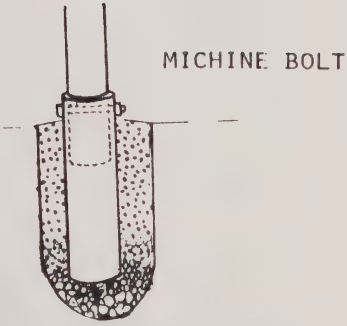
4 - 8 Pad

This shows a concrete pad above ground (for looks) The main support is the pole set in 3 feet of concrete.



4 - 9 Portable Pole

For those of us who prefer to take our dish wherever we go the portable pole is just the thing. You may also want to weld a base onto your camper or motor home as well.



4 - 10 Check Point

RIGHT NOW AT THIS POINT YOU SHOULD:

Know you have no obstruction to the South or be willing to accept those you do have.

Know what type of foundation you are using.

Have the proper type of cement at the work site. So that I don't assume you already know how, have the proper instructions on mixing it.

Have the proper type of tools at the work site.

Have a water sorce for the cement and cleanup.

Have already talked to your insurance agent.

Know you will have good weather long enough to complete the work.

decided whether the coax will be run inside or outside the pole.

START DIGGING

PUTTING THE DISH TOGETHER

5 - 1 The First Tip

The first tip I can offer is,
READ THE INSTRUCTIONS ALL THE WAY THROUGH!
This will usually give you a basic idea of what to do with all that raw material.

PRE-PUBLICATION COPY
NOT FOR SALE

5 - 2 Extra Clips

On mesh type dishes that use wire clip for fasteners, in heavy snow areas it is not a bad idea to use the extra clips on the bottom 2/3 of the dish.

5 - 3 Patience

Some dish assembly procedures are longer than my patience If you find this to be the case, the best thing anyone can do is walk away from it. Give yourself a 30 or 40 minute R & R, if you break it, it will take a lot longer to replace the part.

5 - 4 OLE PIN TRICK

The ole pin in the pole trick. Wheather it is a pet pig or the wind the bolts intended to keep the true South member (fig 6-22) do not keep us on true South. This fact has tempted many dealers to take the time to put a bolt through the yoke (true So member) and ground pole. Call it overkill if you want, I call it preventive trouble shooting.

5 - 5 GETTING IT UP

A large fiberglass Dish with a mount that equalls the weight of the dish can certainly be a job. One alternative is once you have the holes drilled for the mount put the mount on the pole. Then lock it in a straight up position that will enable you to set the dish on it. Now you can put the bolts in without having to crawl under the dish. However you will probably need a ladder!

Centering The Mount

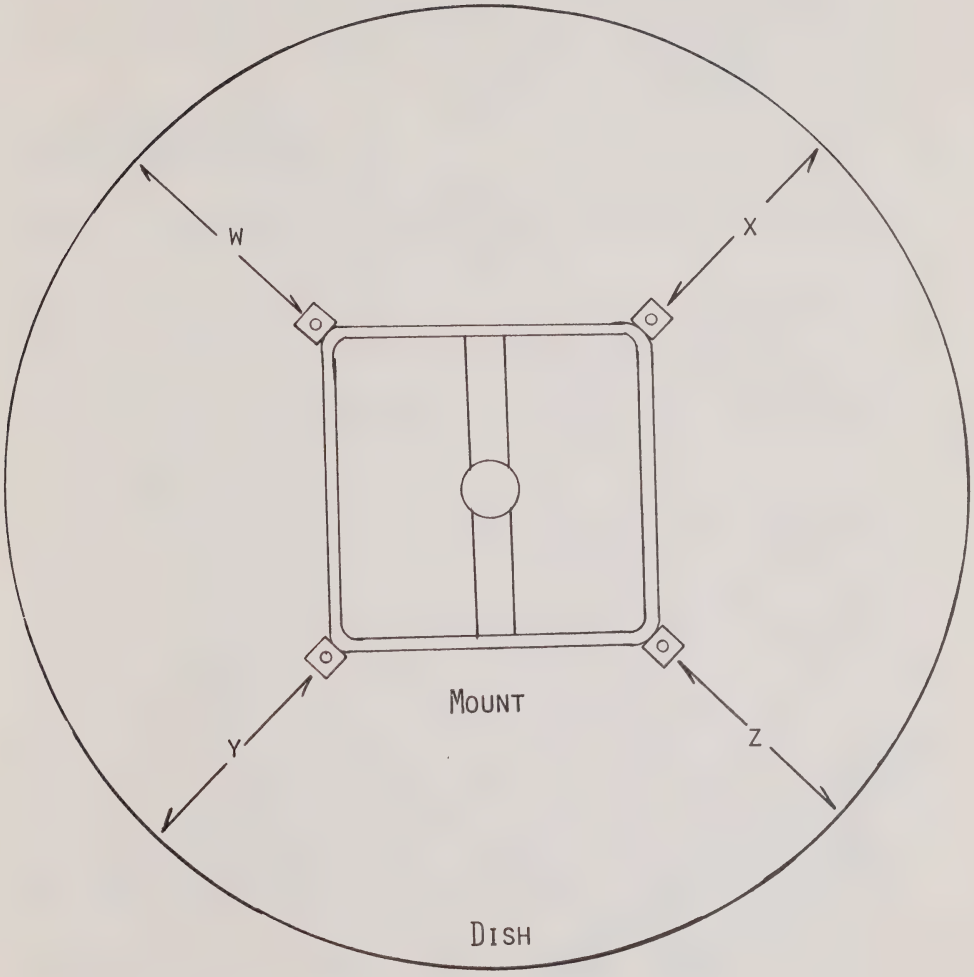


Fig - 5 - 7

AIMING THE DISH

6 - 1 It's So Easy

Easy is only a defination of understanding, particularly when it comes to tracking a system.

There are many methods in use. Here we will discuss three of them. 1. Tracking without a compass but with an inclinometer. 2. Tracking with a compass and a protractor or inclinometer. 3. Tracking the system when all you have is precesion guess-work.
I very seldom use a compass only because in the begining there just never seemed to be one around when I needed it. Call me disorganized if you like. The real trick is once you find a satellite any staellite whether you lucked out in three minutes or you used a transit and it took you two hours. DO NOT MOVE ANYTHING untill you mark each adjustment with a felt pen. It is very frustrating to zero in on a bird with dumb luck. then thinking how easy that was to go looking for the rest of the birds without marking any reference points. Needless to say if you do the same you deserve an " I told ya so "

PRE-PUBLICATION COPY
NOT FOR SALE

6 - 2 Channels For Tracking

When looking for Satcom 3 (F-3) channel 7 ESPN is good to use, being an all sports station it is easy to recognise. If you find yourself confronted with news when you thought you were on ESPN then you went a little to far to the West, bring the dish to the East.
For Satcom 4 (F-4) channel 17 Trinity Broadcasting is easly noticed being all religous. There is nothing located (as yet) directly East, and only a CBS (ov) occasional video to the West.

Providing Anik D is the one you are after, channel 4 the Sports Network or CBMT from Montreal. Listen for a French accent. channel 20

Note:

All of the above channels are on the vertical polarity.

6 - 3 Progammable Receivers

These type receivers will add an extra step when trying to locate a satellite for the first time.
Almost all programmable receivers come with a scan feature enableing the receiver to scan all 24 channels in 5 to 15 seconds. What all this means is you need to; A. Use the scan mode when locating the first satellite and B. be a bit more attentive when watching the TV screen. A good rule of thumb is if you see anything other than snow stop moving the dish and watch the screen a minute while the receiver scans. If it appears you have something switch the scan off, and locate the best picture.

6 - 3 Progammable Receivers Cont.

Then program the receiver as per manufactures specifications for the channels listed under channels for tracking (6-2) Last but not least do not forget to put batteries in for the back up memory (if required) and the remote control.

6 - 4 Weather Permitting

At this point weather permitting, you should set up a bench or table by the dish. Now you finally get to hook up all those goodies. To accomplish this you will need several jumper wires or cables (short pieces of cable) A multiplug outlet at the end of your extension cord. If the TV will not directly accept the coaxial cable you will need a 75 to 300 Ohm transformer, it screws on to the TV in two places where it says VHF. The other end connects to the cable from the receiver indicated by IF out, or To TV.

Oh, you say. the only TV I have is a 300 pound 6 foot screen in the bedroom, and I am not about to move it!!! Well.....!!!! So be it, there is no way to rent, borrow, or make a TV to use out at the site. You will need a helper or two or three to relay what is on the screen to the individial at the dish. Maybe you can use the kids walkie talkies??

6 - 5 Check Point

Be sure the polarity is set for virtecal on the receiver before you hook up the polar rotor wires.

6 - 5 Check Point Cont.

The A F C should be in the off position.

Channel selector should be on one of our predetermined channels (6-2)

If you have several audio type selections on the receiver, select the one that says mono.

Set programmable receivers on scan.

Double check all connections, be sure the inputs are in and the outputs are out.

Check that the TV channel selector is set to the specified output of the receiver.

6 - 6 Hooked Up

So now we are ready everything is hooked up. Here are the next 3 things you need to do. 1. Be patient. 2. Make only one adjustment at a time. 3. follow direction very care fully.
Most polar mounts have three adjustments. 1. The elevation 2. The alignment of true South 3. Declination. Some mounts have a (built in declination) these are uaually manufactured and sold locally as no one declination will work throughout the world.

6 - 7 Tracking Without a Compass

First locate the necessary coordinates fig 6-21.

ELEVATION SATCOM 3 _____ SATCOM 4 _____

ZENITH _____

DECLINATION _____

Second point the dish South using precision guess-work.

6 - 8 Declination

Third using the protractor provided, or your very own inclinometer set the declination as per your location (fig 6-21) The instructions provided with the dish should provide details on the mechanics of the adjustment for your particular type of dish.

PRE-PUBLICATION COPY
NOT FOR SALE

6 - 9 Elevation

Fourth using the protractor provided or your very own inclinometer, place the inclinometer 1. on the part of the mount that parralels the face of the dish or 2. Using a straight edge accross the face of the dish place the inclinometer on it adjusting the elevation. Once the declination and elevation are set the dish will be close to the zenith (the upper most elevation or satellite on the Clarke belt)

Now before you loosen the two bolts you tightend after setting true South position is marked. Now move the dish very very slowly East or West (3 inches Max either way) untill you get the best possible picture or meter reading on the receiver. At this point you should have some kind of picture, if not re-check your work up to this point.

6 - 10 Tuning the Zenith

Now that you have a picture, any picture even if it looks like crap, tighten the true South bolts. Now move the elevation up and down (after the original setting is marked) to tune in the picture. Next adjust the polarity to get the best picture (on some receivers the polarity is noted as the fine tune)

6 - 11 Tracking

Using the hand crank or slide arm move the dish toward the respective satellite. If you are East of 104 degrees longitude use Satcom 4, West of 104 use Satcom 3. Look up the proper elevation for which ever satellite you will move toward (fig 6-21) use of the inclinometer will allow you to know when you should be right on the satellite. Do not be concernd if you are not. Next loosen the true South bolts. At this point you should be able to swing over to the opposite side to F-3 or F-4 (depending on where you started) watching the TV as you move the dish you should notice other satellites as you make the journey. If you have difficulty, do not adjust the elevation. Go back to step 3 and proceed from there.

6 - 12 Note

When moving the dish and all of the mount as in the true South movement it is very important that this be done a ¼ or ½ inch turn at a time.

6 -13 Tracking With a Compass

First locate the necessary coordinates (6-21.

ELEVATION	SATCOM 3 _____	SATCOM 4 _____
AZIMUTH	SATCOM 3 _____	SATCOM 4 _____
DECLINATION	_____	
MAGNETIC DEVIATION	_____	

Second is to set the dish to true South. Using a compass and compensating for the magnetic deviation aim the face or front of the dish to true South, tighten 2 of the true South bolts (fig 6-22) then be sure and mark the ground pole for the South reference.

6 - 14 Declination

Using the protractor provided or your very own inclinometer set the declination as per your location. (6-21) The instructions provided with the dish should provide details on the mechanics of the declination adjustment for you particular type of dish.

6 - 15 Elevation

Using the elevation information from 6-21 for Satcom 3 and the declination, add the two together for the total elevation setting. (except when useing a dish with built in declination. Then use only the elevation.
Now move the turnbuckle (elevation adjustment) up or down to set the proper elevation. Using the slide arm or the hand crank move the dish to the West 131 degrees, at this

6 - 15 Elevation

point you may have to make some small adjustments with the hand crank and turnbuckle. Once you have tuned in F-3 swing the dish to the other side F-4 (83 W) watching the TV as you move the dish if you see different pictures or satellites as you move the dish across the Clarke belt it is a good indication that the dish is right on target, or at least close to it. If you do not have a good quality picture on all the satellites at this point use the following diagrams to fine tune your system.

6 - 16 Tracking

Fig 6-23 Declination too high. Move to F-3 or F-4 loosen declination move down to fine tune.

Fig 6-24 Declination too low. Move to F-3 or F-4 loosen declination adjustment move up to fine tune.

Fig 6-25 Elevation too low. Use turnbuckle to adjust.

Fig 6-26 Elevation too high. Use turnbuckle to adjust.

Fig 6-27 True South adjustment too far East. Move to the West very slow untill picture comes in or gets better.

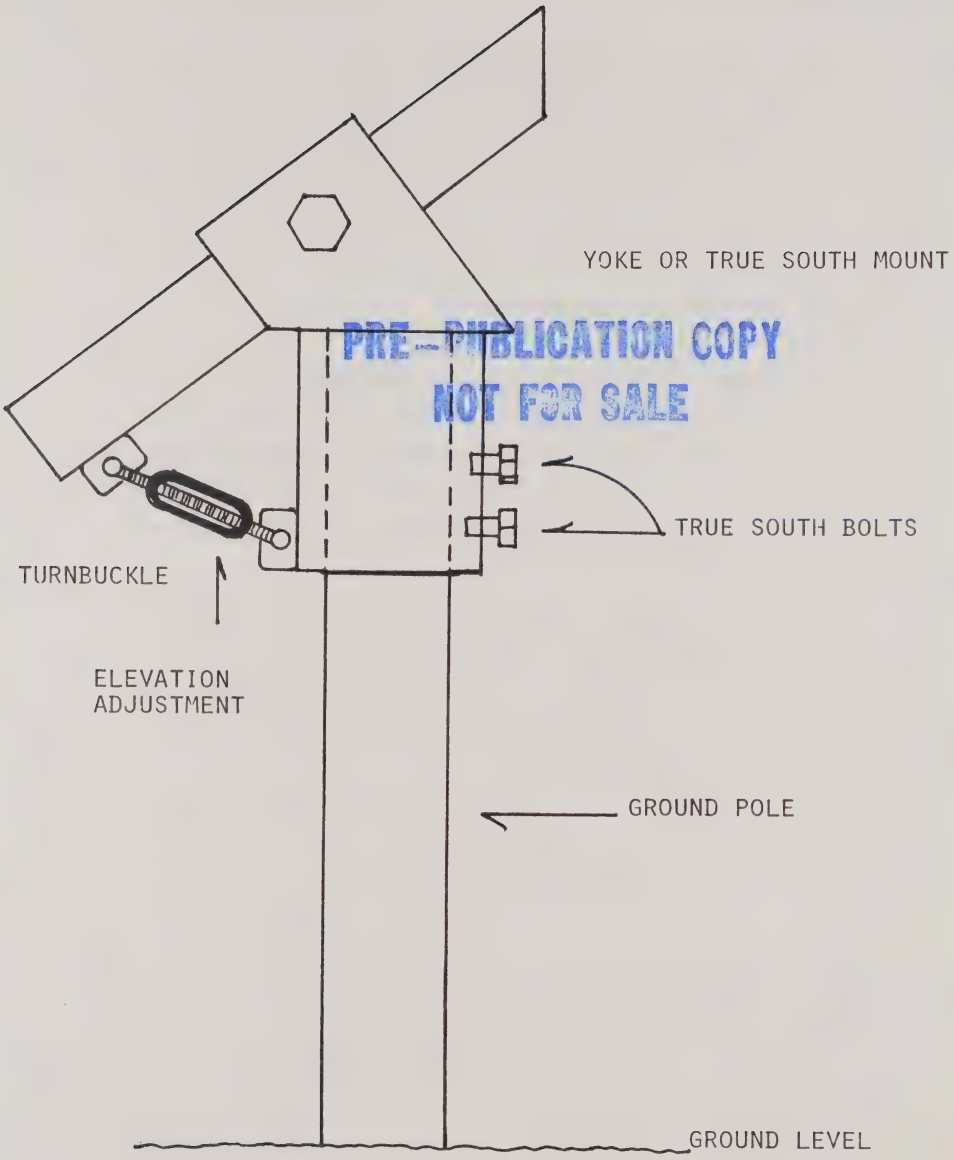
Fig 6-28 True South adjustment too far West. Move to the East very slow untill picture comes in or gets better.

6 - 17 Note

Do not make more than ONE adjustment at a time. After each adjustment pan the dish across the Clarke belt to F-3 or F-4 which ever one is opposite to the last one you were on. Each time you will be getting closer to the perfect picture.

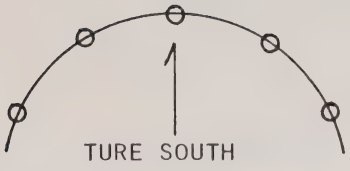
6 - 18 No Compass No Inclinometer

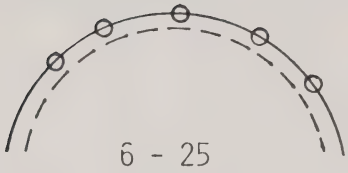
Read 6-6 through 6-10 for the basic concept. This method only differs in the begining. Find the zenith elevation for your area, then set the dish elevation with your best guess. At this point you may start looking for a satellite using any of the adjustments and 15 to 45 minutes of patients.
The key or trick to this method is, once you locate a satellite, any satellite, find out which one it is.
1. Mark all the adjustments, just in case you get lost.
2. Locate the zenith bird for your area. 3. Follow instructions starting with 6-9.

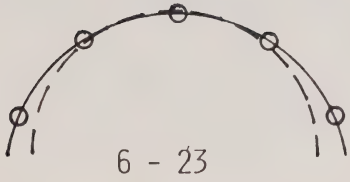


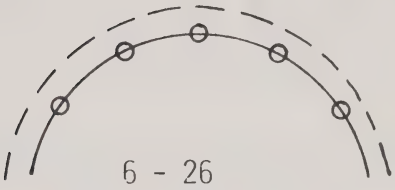
PRE-PUBLICATION COPY
NOT FOR SALE

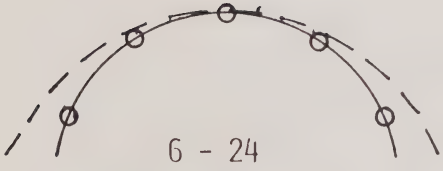
FIG 6 - 22

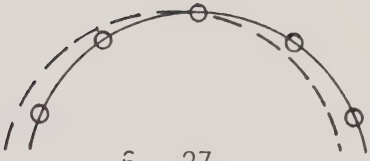

TURE SOUTH

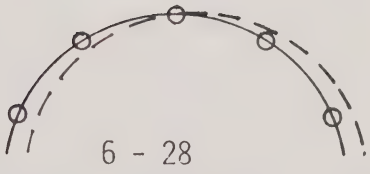

6 - 25


6 - 23


6 - 26


6 - 24


6 - 27


6 - 28

PROCEDURE

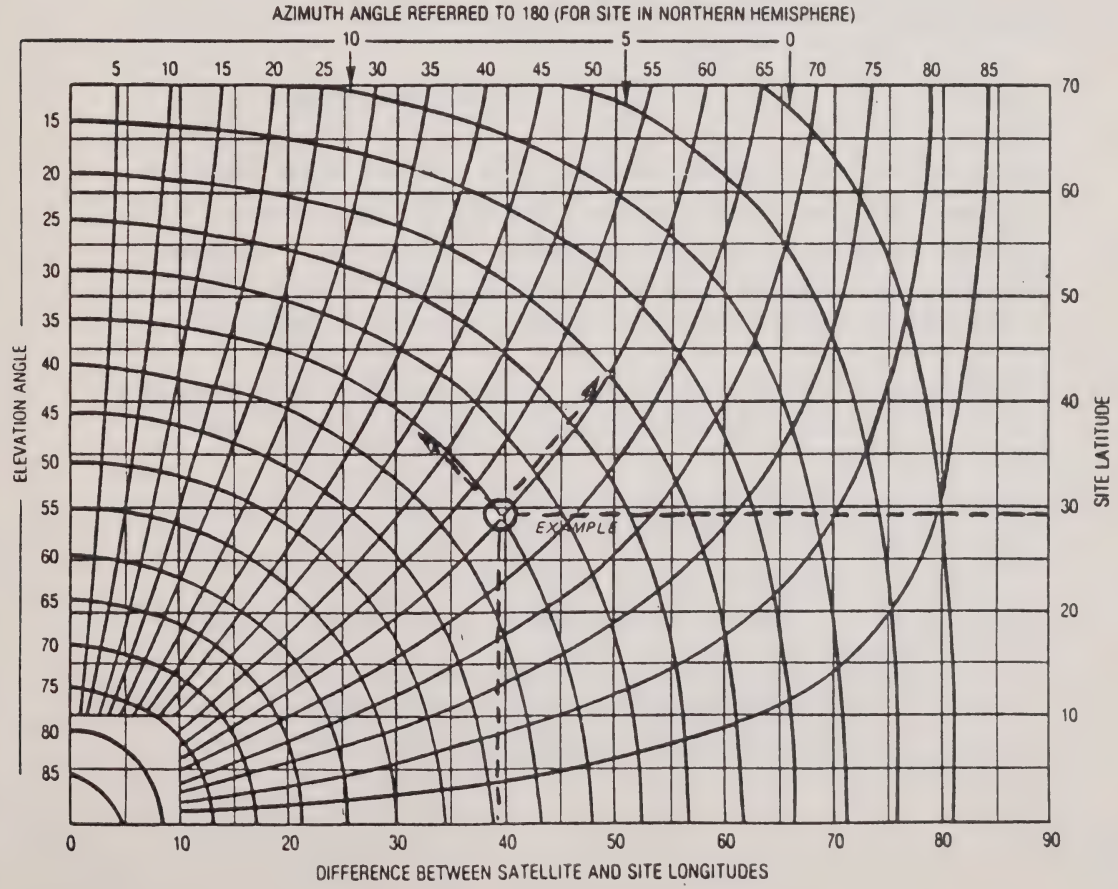
- From a good map, determine the latitude and longitude of the earth station site.
  (Example: Houston, Texas—Longitude 95.5° W, 29.5° N)
  (Example: RCA Satcom 1—135° W)
- Calculate the difference (in degrees) between the satellite longitude and the site longitude.
  (Example: 135° - 95.5° = 39.5°)
- Use the graph below to determine the azimuth and elevation angles for the antenna.
  (Example: Elevation about 35°, azimuth about 59° west of south for the Houston site.)

OFFSET ANGLE CHART

Lat.	Offset Angle	Lat.	Offset Angle	Lat.	Offset Angle	Lat.	Offset Angle	Lat.	Offset Angle
1	.01	16	2.8	31	5.1	46	7.0	61	8.3
2	.36	17	3.0	32	5.3	47	7.1	62	8.3
3	.54	18	3.1	33	5.4	48	7.2	63	8.4
4	.72	19	3.3	34	5.5	49	7.3	64	8.4
5	.90	20	3.5	35	5.7	50	7.4	65	8.5
6	1.07	21	3.6	36	5.8	51	7.5	66	8.5
7	1.25	22	3.8	37	6.0	52	7.6	67	8.5
8	1.43	23	4.0	38	6.1	53	7.7	68	8.6
9	1.60	24	4.1	39	6.2	54	7.8	69	8.6
10	1.78	25	4.3	40	6.3	55	7.8	70	8.6
11	1.95	26	4.4	41	6.5	56	7.9	71	8.7
12	2.13	27	4.6	42	6.6	57	8.0	72	8.7
13	2.3	28	4.7	43	6.7	58	8.0	73	8.7
14	2.5	29	4.8	44	6.8	59	8.1	74	8.8
15	2.6	30	5.0	45	6.9	60	8.2	75	8.8

OFFSET ANGLE CHART

Reprint From Summer '82 STV


AZIMUTH ANGLE REFERRED TO 180 (FOR SITE IN NORTHERN HEMISPHERE)
10
5
0
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85
ELEVATION ANGLE
15 20 25 30 35 40 45 50 55 60 65 70 75 80 85
SITE LATITUDE
70 60 50 40 30 20 10
EXAMPLE
0 10 20 30 40 50 60 70 80 90
DIFFERENCE BETWEEN SATELLITE AND SITE LONGITUDES

WINTER SUMMER

7 - 1 Don't Be Lazy

Whether it be summer or winter, weather proofing is a year round concern. Most components are weather resistant few are weather proof.
This is really not a difficult part, thats why I say don't be lazy. All that is required is 1. Seal every seam and cable connection no matter how weather proof they look. 2. Get a boot for the acuator and a bullet or cover for the feed system. This little bit of effort will prevent the majority of murphys law from showing up at prime time. See 3 - 7

NOTE: Do not put sealent on the threads of the connections.

7 - 2 Winter Concrete

Whenever possible mix the concrete inside your garage or at the warmest part of the day. Air entrained portland cement contains an agent that forms billions of microscopic air bubbles in the concrete. After it hardens there is virtually no scailing. Ready mix should be around 6% air entrained.

A couple of things that may need some consideration before we jump out in the snow to put up our new dish.

1. How are you going to dig the hole?
   Power digger or pick and shovel.
2. What kind of cement is to be used?
   See what is common for the area.
3. Be constantly awear of electrical shock
   keep power tools out of the snow and
   out from under snow coverd trees.

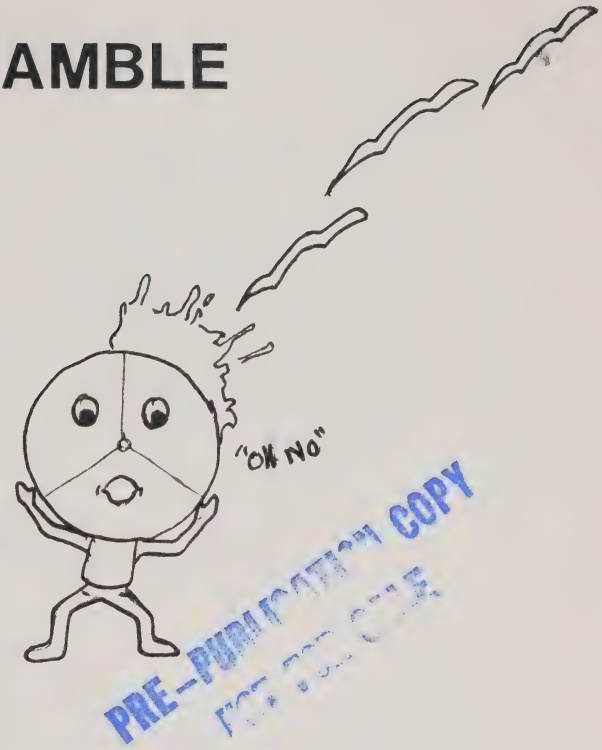
7 - 3 Ground Preperation

Next is to clear the snow from a large enough area usually 15 to 25 squar feet. You may perfer to use a canvas or the box the dish came in.

If after the site survey you need to thaw the ground, you should plan on about an hour of fire or coals per frozen inch. Example: in the middle of winter if the area you live in has a frost line of 6 inches plan on maintaining a hot spot for about 6 hours.

THE GAMBLE

8 - 1 LIGHTNING

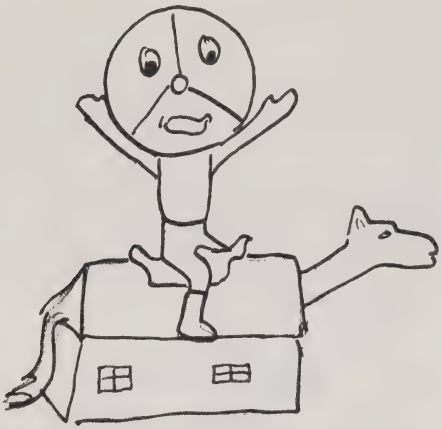


PRE-PUBLICATION COPY

If you live in a humid region or some low dessert areas you may want to read on. What we are talking about is IF. If a blot of lightning hits the ground within a quarter mile of your equipment it could completely destory the electronic components. Be sure to read your home owners policy, ok-ok so then call your agent and ask him about being coverd for the IF of lightning.

Considering the only component that is not already grounded (supposedly) is your receiver, this protection can be obtaind by a surge protector. Place one between the downconverter and receiver and one on the 110v wall outlet.
Please be aware that no system can survive a direct hit. The majority of dealers will not be able to replace components fried by lightning. So all in all, this individual feels the best insurance against lightning is insurance itself.

ROOF MOUNTS



9 - 1 Roof Mounts - Insurance

Insurance!! I thought we were talking about roof mounts? nope,we will talk about roof mounts + insurance = = = experience. Did you know satellite dishes love Mercedes y a and whenever they get loose you can bet they will try to find one to land on. It used to be a joke around the store whenever there was a major storm, with over 1000 installations in five states you have a tendency to drive by the store first to see how the crowd is, or to put your ear up to the door of the office to see if the phones are ringing off the wall. Fortunately we had never had a weather related claim. Although after one severe storm we had one gentelman that tried, as it turned out he had installed a tracker incorrectly, witch resulted in bending the dish and mount. He fooled the insurance company but not us.

Some insurance companies may require a structural analises by an engineer before adjusting your policy. I highly recomend you make that ever so painful effort to be sure your roof and dish are coverd by your policy. Now that you jumped right up and took care of that we can continue.

9 - 2 Survey

Presumedly the chapter on site surveys has led you here? Good, then you should have no difficulty finding your way back. You need to determine whether or not you have a clear path from the roof to the Clarke belt. Don't forget to check with your local zoning board! If they don't know what Clarkes belt is they may not want you looking at it, let alone from your roof!

9 - 3 Respect Your Roof

I really feel roof mounts is a subject that must be coverd in detail. A dab here and there will only get us confidently in trouble. One should have a good background in handyness, shadetreeness and a degree in precission gusse-work. If you lack these qualifacations I suggest you find someone who does not.

This does not mean you have to turn the whole project over and let the other guy have all the fun. Shucks if you are a welder by all means, make your own mount, run the cable, hook things up, but you may want to hire a contractor to reinforce the roof. It all depends on ones abillities. Either way just keep in mind a roof is designed to withstand 20 to 60 psi (downward pressure) like from snow. Our standard roofs are not designed to withstand thousands of pounds of lift or upward pressure.

HIGH POLE MOUNTS

11 - 1 High Poles

Simple enough, put pole in ground, put dish on pole. Only one thing, you will probably need to repeat step one and two after each storm.
Most of us have a difficult time judgeing heights above 12 feet so if your built in laser measuring system is on the blink please use the old standby, a tape measure.

PRE-PUBLICATION COPY
NOT FOR SALE

11 - 2 Off Balance

Once upon a time there was a sixteen foot pole without a dish on it. The pole was bolted to the side of the building the roof about 45 degree angle, the dish a 120 pound Continental, two sixteen foot ladders and five nice guys that said, I think we can, I think we can,.....
What is it about being off balance sixteen feet in the air that makes 120 pounds feel like 1200 pounds? Each of us tempted murphy's law to the max that day. The fifty to eighty dollars it would have cost is not worth the risk of dropping the dish or self, or dish on self. both of which almost happend that day. Remember the closer to the ground the better.

11 - 3 Survey

Using the obstruction of height formulas (1-3) to determine where the dish can be located. Measure the distance to find out the necessary lenght of the pole. Make a note of the length. Next give some thought about the cable run, there are 2 basic options; 1. For inside wall locations see (3-5) 2. The outside wall if the pole is A. Flush up against the wall and B. If the TV is located on the same

11 - 3 Survey Cont.

Wall or an adjoining wall you may want to cut or drill a hole in the pole at the same height the cable will enter the wall see (11-8.5)

11 - 4 Flush or Offset

Next you will need to find out if the pole can be flush mounted to the wall or if it will need to be offset due to the type of foundation supporting your house. To find out start digging where the pole will be buried. Sometimes when digging a hole close to the side of a house you will be discouraged about 20 inches into the dig. You may hit part of the foundation. Now comes the work, dig down to the bottom to the foundation if it sticks out, only a small amount you may be able to chip it away so that a flush mount can be used.

On the other hand if we are talking about 6" or 8" inches in width and 12" inches in height/depth,(fig 11-15) you may have to consider offsetting the pole as shown in the circle (fig 11-16) An offset pole mount will require 12" to 24" inches additional depth for the pole and some special attention to fastening the pole. At this point you should know whether a flush or offset mount will be used, remember the measurment you made (11-3) add to that, 3 feet for a flush mount. 4 feet minimum see 11-6 for an offset mount. You may now order the pole!

11 - 5 Soffit or No Soffit

Some roofs are constructed so as the rafters are visable from the ground (no soffit) Some are not (soffit, fig 11-18)

11 - 6 Pole Length and Tabs

A little thought here may save a lot of sweat later. Have you ever pictured standing on the roof trying to drop a 24 foot 250 pound pole through a 4½ in hole? A 24 foot pole will not slide up through the bottom of the soffit. You may want to put this puppy on the side of the house instead of the back. Normally the roof is flush at the side of the house, however this decision is directly related to the type of foundation of your house. Smaller poles around 14 feet can be dropped through the roof and soffit providing the pitch of the roof is reasonable and you have plenty of help.

A word about the tabs on the pole. You need not be concernd if this will be a side mount. Although a rear mount through a soffit and roof will require no tabs, or tabs that can be put in the pole once in position. I recommend the later of the two.

11 - 7 Check Point

RIGHT NOW YOU SHOULD

1. Recognize that you are using an inside or outside wall.
2. Know exactly how the cable will be run.
3. Have determind flush mount or offset, and soffit or no soffit.
4. Be familiar with the type of soil conditions, concrete, and pole foundation to be used.
5. Have a good idea how the dish is to get up on the pole.
6. Know the exact pole length and whether it will be mounted on the side or back of the house.

11 - 8 Pole in Back of the House With Hole in the Eave Flush Mount With Cable Through an Outside Wall

8 . 1 First measure from the closest edge of the house to the center of the hole in the ground for the pole. Make a small mark on the wall.

8 . 2 Measure that same distance up under the eave (fig 11-19) mark the location, you should be directly above the hole in the ground for the pole.

8 . 3 If you have a soffit you must locate the rafter, as the pole can not extend through a rafter. You should be to the right or left of the rafter. Three ways to find the rafter are 1. Look for nail heads through the soffit. 2. A stud finder. 3. Drill several small holes through the soffit at the same angle, remember we are talking about a 4½ inch diameter hole. If you do not inspect each inch of the proposed 4½ inch area no one else will.

8 . 4 Proceed to cut the 4½ in diameter hole through the soffit then the roof. You may want to remove a couple of the shingles as they are hard on saw blades. They can be cut to fit and replaced later. The reason for a 4½ inch hole instead of a smaller one is to provide room to plumb the pole once it is in place.

8 . 5 To install the coax inside the pole and through an inside wall, drill the hole in the wall that will carry the cable into the house. This hole must be in the center of the hole dug for the pole (the mark on the wall from 11-8.1) The type of drill bit you use will depend on the exterior materials of your house. The size is related to the size or quanity of cables. It is highly recomended to turn off the power at the breaker box.

8 . 5 Cont

This is only necessary for that particular part of the house.

CAUTION: When you turn the power on remain at the breaker box for a minute, if the breaker trips it means you have drilled through some electrical wire. Do Not turn it on again untill it is repaired. This is very rare as the electrical wires are seldom below 10 inches in height within the wall.

8 . 6 Once the pole is in position cut or drill a hole in the pole at the same height as the one in the wall.

11 - 9 Pole Fishing

Now fish the cable upward from the bottom to the top. A problem may exist with this procedure on a hot day using only one RG-6 cable as it will become to soft. You may need to use a wire fish. Also depending on the type of yoke or true South mount you have it may be necessary to drill a hole about 12 inches from the top if the pole as an exit for the cable. Leave 5 to 10 feet of cable at the top depending on the size of dish. Now feed the remaining cable into the house through the hole in the wall. At this time you may rotate the pole so the hole in the pole and the hole in the wall match. Proceed by pouring the concrete, sealing the area around the cable with caulking.

P.S. After you pour the mud, be sure the pole is PLUMB!

11 - 10 Actuator Now or Later

Wheather you put the acuator on now or use the hand crank, someone will need to be on the roof to make adjustments when tracking the dish. See (6-3)

11 - 11 Securing the Pole to the Wall

Caution should be the key word in this section. The proper fastener and wall combenation are a must. Many measures of safety in our world depend wholy on a 20¢ washer or bolt, the satellite industry is no exception. Walls are designed to support downward pressures not inward or outward presure. Looking at figures 11-20 through 11-22 will show that all that is between you and the outdoors is a piece of plywood, some insulation, and a little wall board. Most of these applications will require a toggle or molly bolt and some plumbers tape. I suggest the same for red brick, that is to say drilling through the red brick and sheathing, gaining support from the wall as a whole, not just the brick. (fig 11-21)

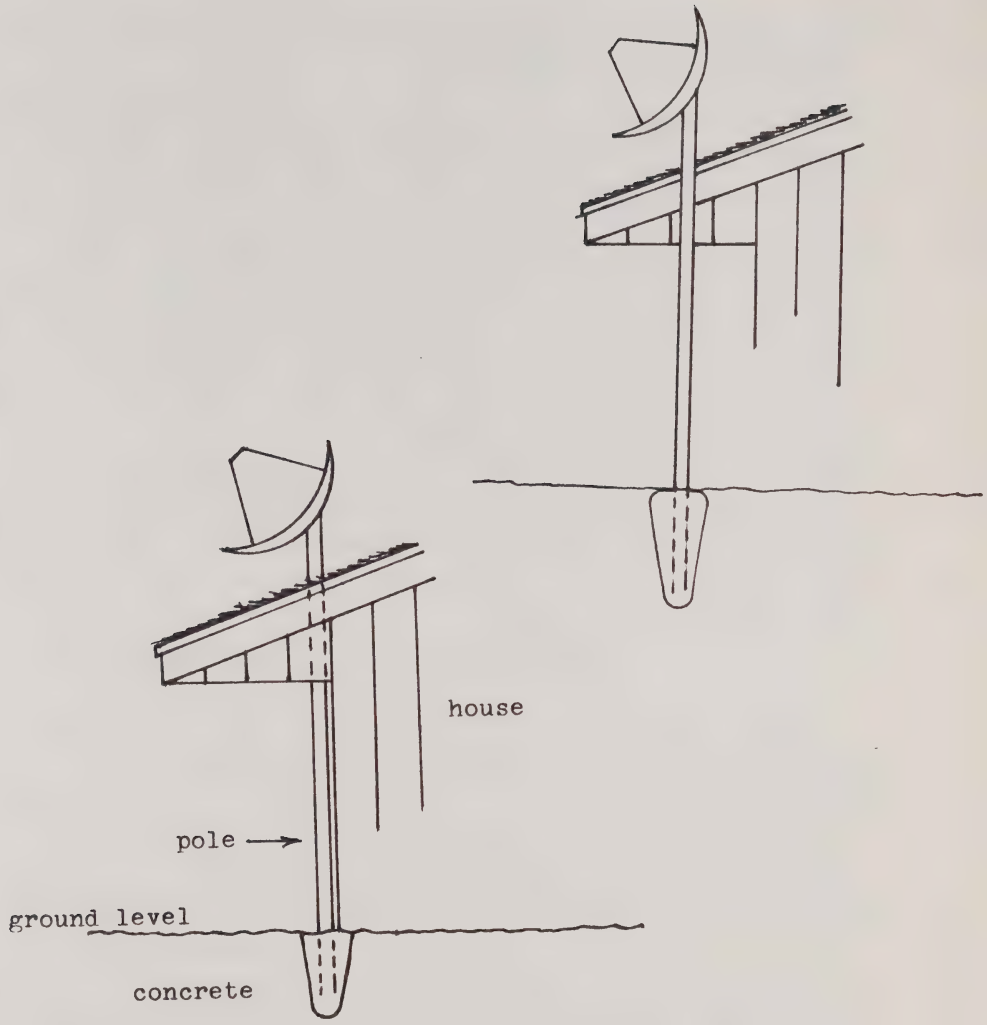
11 - 12 Securing the Pole to a Block Wall

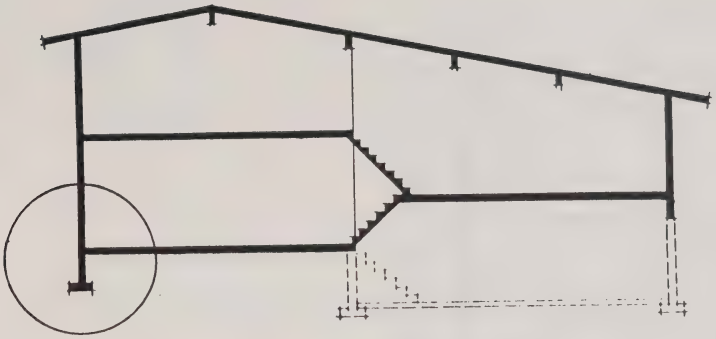
Be sure to ask for a masonary bolt for this application , study the difference in the gloss ry, many people including some store clerks are not aware of the difference between a molly bolt and the masonary bolt. The main difference is the area of surface grip and the strength of the grip. Two very inportant factors when it comes to maintaining a zero tolerance of movement.

CAUTION, When drilling through the exterior of the wall do not apply heavy pressure to the drill as you may poke a hole in the interior wall of the house. Also exercise the CAUTION discussed in 11-8.5

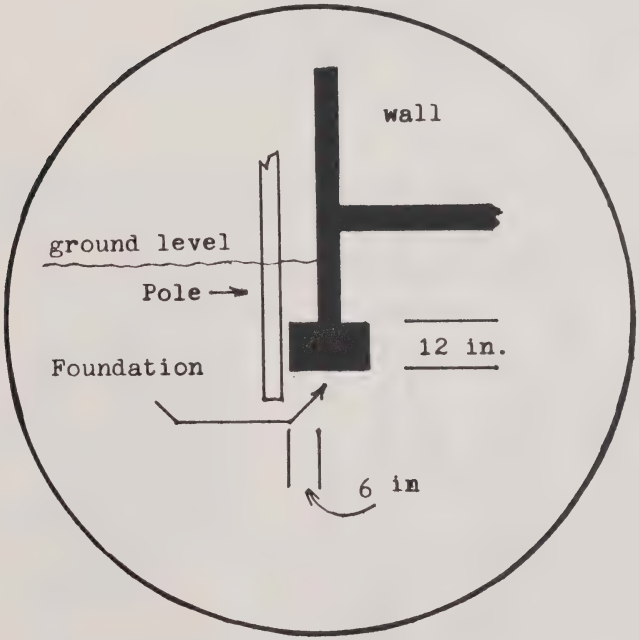
11 - 13 Guy Wire Installation

As stated before, the only use for a wood threaded eye bolt, screwed directly into the roof is to create a leak. Providing you want to include a sense of secruity to the installation, properly installed guy wires will do it. First be sure one has access to the attic where the eye bolts are to be located. If you just hop up on the roof and drill a couple of holes you may find a heating duct between you and that brand new hole. Next make the proper measurments for a 2 X 12 wood bracer (fig 11-23)
When you do drill the hole, drill it from the attic side, in the middle of the brace. A turnbuckle will allow you to KEEP the proper tension on the guy wire. NOTE; When securing the turnbuckle to the true South bolts, be sure you follow the suggestions in (5-4)

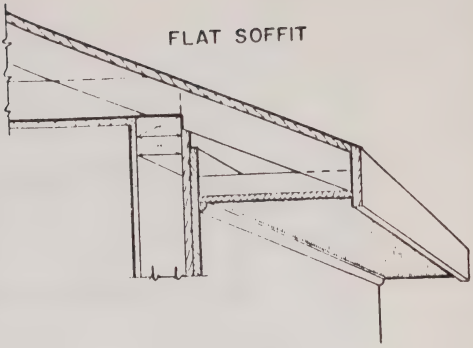

house
pole
ground level
concrete



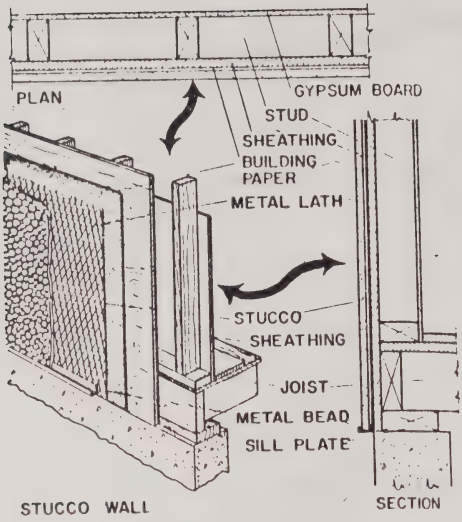
Split-level house with three living levels—pitched roof and various ceilings.



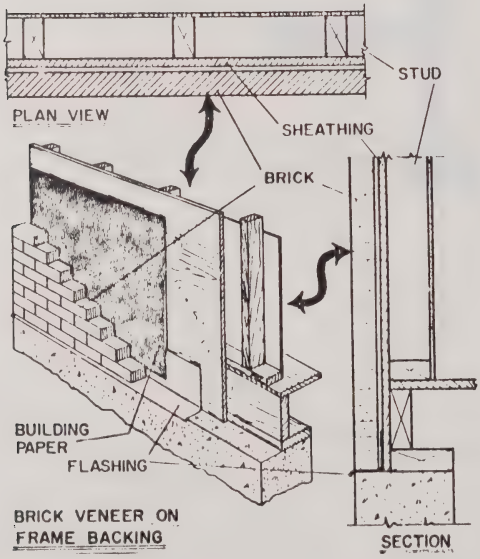
OFFSET POLE
FIG 11 - 16



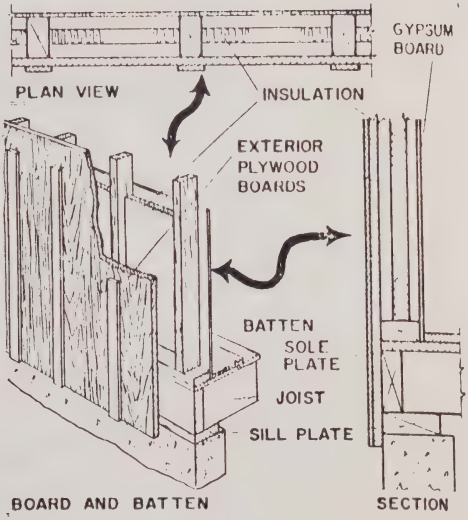
11 - 19



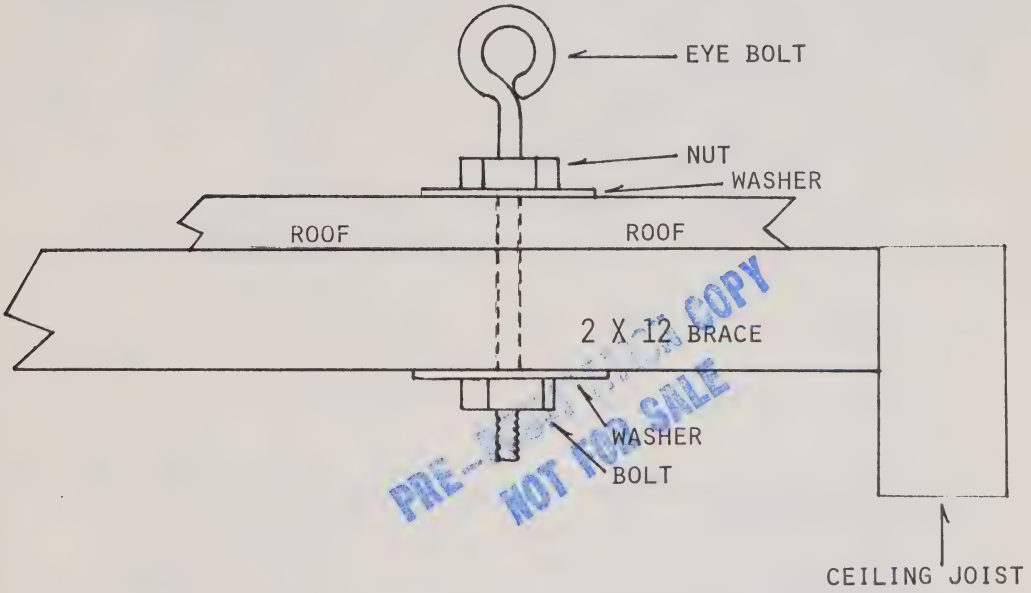
11 - 20



11 - 21



11 -22



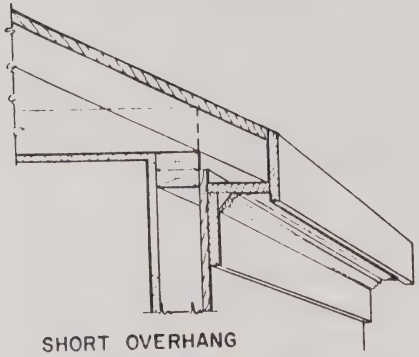
PRE-PUBLICATION COPY
NOT FOR SALE

CAULKING INSIDE HOLE AND BETWEEN WASHER AND ROOF

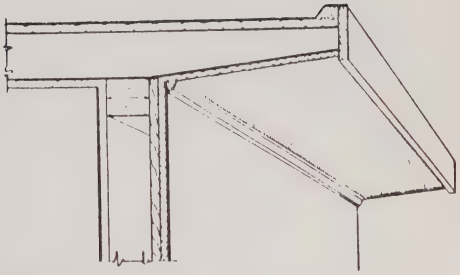
FIT BRACE BETWEEN TWO CEILING JOIST THEN NAIL IN PLACE

11 - 23

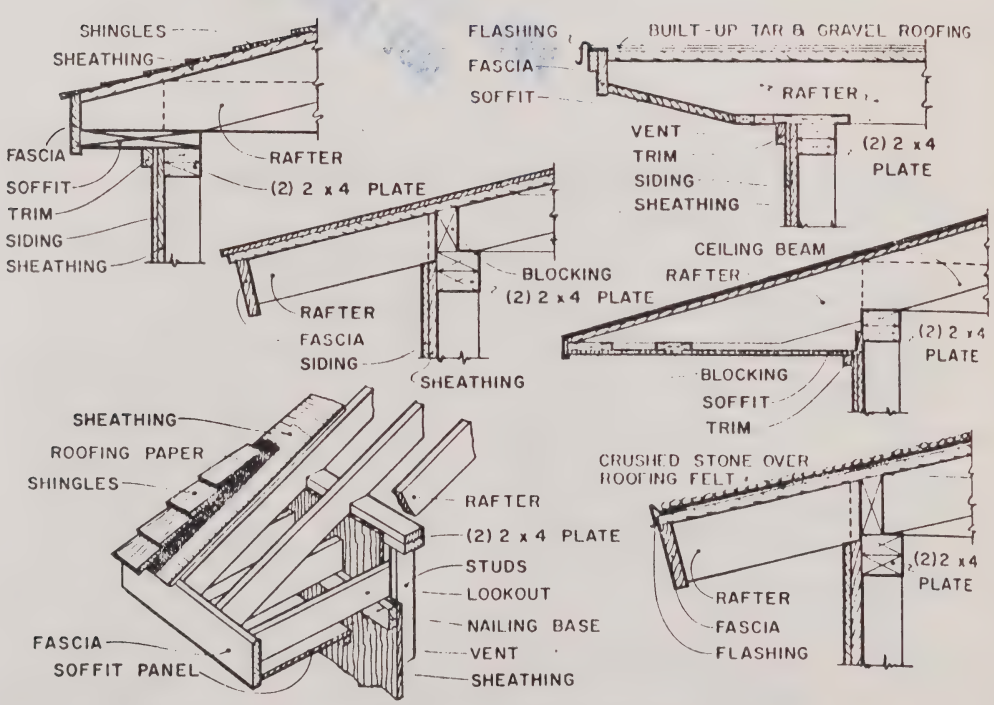
EYE BOLT INSTALLATION



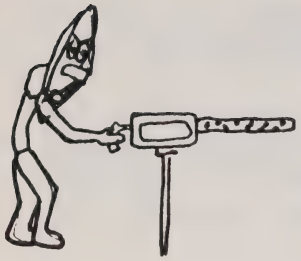
SHORT OVERHANG



FLAT ROOF OVERHANG
WITH TAPERED SOFFIT



TROUBLE SHOOTING



12 - 1 NO AUDIO, VIDEO, NO INDICATOR LIGHTS ON THE TV AND/OR THE RECEIVER.

1.1 TV or receiver not plugged in.	.1 Plug in TV or receiver.
1.2 TV or receiver not turned on.	.2 Turn on TV or receiver.
1.3 Blown or missing fuse.	.3 Replace fuse with exact size. Some fuses are located inside with no external access see # 4.
1.4 Loose wire or solder connection.	.4 Turn off and unplug unit. carefully remove cover and visualy inspect wires

12 - 2 RECEIVER BLOWS THE FUSE WHEN TURNED ON.

2.1 Short in the receiver.	.1 May be proven by replacing the fuse and disconnecting all cables. Turn the unit on, if it blows the fuse return the unit to an ASC. Also see 1.4
2.2 Short somewhere in the system other than the receiver	.2 Check continuity of all cables and other components

12 - 3 NO AUDIO, VIDEO, RECEIVER HAS POWER, BUT BLANK ON TV. NO RESPONSE FROM SIGNAL STRENGTH METER (SSM)

3.1 Cables not tight or not connected to receiver, TV, DC, LNA. or modulator. Also you may have hooked up the input and output backwards.	.1 Connect cable, tighten cables wiggle cable to check for bad connections. Reverse cables.
3.2 No power at DC,or LNA.	.2 Check for power at the DC, and LNA 14 VDC is common. tuning voltages, 4 to 13 VDC. If no power see 3.3
3.3 Defective cable between receiver and DC, LNA	.3 Check continuity if continuity is ok check power out, from receiver to DC
3.4 No power output from receiver to DC.	.4 Return to ASC.

12 - 4 NO AUDIO, VIDEO, SSM. DC, LNA, AND RECEIVER HAVE POWER. TV HAS ALL SNOW AND SOME STATIC FOR AUDIO

4.1 See 3.1 through 3.4	.1 Check all of section 3
4.2 Dish misaligned	.2 Realigne dish
4.3 Feed system misaligned	.3 Check focal length even if you know it is right.

12 - 4 CONTINUED

4.4 TV not set on the same modulated output of the receiver.	.4 Set to recomended receiver instructions. Then fine tune the TV and receiver. If that does not work try channels 2 through 6, one at a time and fine tune

12 - 5 INFERIOR AUDIO, VIDEO, ON ALL CHANNELS ON ALL SATELLITES

5.1 See 3.1 and 4.1 through 4.4	
5.2 Bad cable or connection causing large signal loss.	.2 Confirm then repair or replace
5.3 Defective LNA	.3 Providing you can find the amp rating for the LNA you can insert an ampmeter to detect a blown amplifier stage. Or return to ASC
5.4 Cable run too long	.4 To prove this out hook up the equipment at the dish, if the picture improves it is the cable.
5.5 Unwanted tenant living in the polar rotor	.5 Remove tenant, place a bug cover over the LNA.
5.6 Invert switch in the wrong position.	.6 Locate and flip, turn, or push.
5.7 Polar rotor misaligned	.7 See 4.3

12 - 6 INFERIOR AUDIO, VIDEO, ONLY ON PART OF THE CHANNELS. EXAMPLE, CHANNELS ONE THROUGH EIGHT OR EIGHT THROUGH SIXTEEN, OR SIXTEEN THROUGH TWENTY FOUR. ANY ONE OF THESE SETS OF CHANNELS MAY BE MESSED UP WHILE THE OTHER TWO ARE CLEAR.

6.1 See 5.3 it is the most common.

6.2 The downconverter may be out of tune. .2 Tune the DC as per manufacture instructions.

6.3 The wire you have used from the receiver to the tuning voltage on the DC may be to small. .3 Replace with recomended wire guage.

12 - 7 RECEIVER IS DRIFTING, GRAIN'Y OR COLOR LOSS, IN THE PICTURE.

7.1 See 4.3

7.2 Defective modulator. .2 Adjust fine tune on TV. Try leaving the receiver on 24 hours. Return to ASC.

7.3 Possible TI .3 See chapter 13

12 - 8 AUDIO, VIDEO OK. PICTURE FADES IN AND OUT.

8.1 Receiver drift. .1 Return to ASC.

8.2 Downconverter .2 Replace

12 - 8 CONTINUED

8.3 Loose dish or mount.	.3 One should be able to lean against the dish with no movement
8.4 Loose or defective connection.	.4 See section 3.
8.5 Heavy dew, rain or snow	.5 If you have not sealed all of the components, disconnect power and remove the LNA and DC let dry and replace. review manufactures instructions, some components require holes to be drilled in the case to allow moisture to excape.

PRE-PRODUCTION COPY NOT FOR SALE

12 - 9 VIDEO LOOKS FUZZY, GHOST IMAGES OR ANOTHER PICTURE OVER LAPPING THE ONE YOU WANT.

9.1 Feed system not aligned with polarization of the satellite.	.1 Rotate polar rotor and/or align feed system.
9.2 Bad connection in feed system	.2 Check polar rotor wire, polar rotor motor output from the receiver.
9.3 Dead batteries in the polar rotor control box	.3 Replace batteries. When the receiver has a built in control the batteries may be located in the receiver.

12 - 9 CONTINUED

9.4 Modulator output freqency may be out of adjustment.	.4 Fine tune TV and/or leave receiver on 24 hours. Return to ASC.
9.5 Local TV station broad casting on the same channel that the receivers modulator is on.	.5 Return to ASC.
9.6 Poor quality coax cable.	.6 Replace with proper cable.

12 - 10 GREAT VIDEO ON PART OF THE SATELLITES BUT NOT ALL

10.1 Dish is out of alignment	.1 Retrack dish
10.2 Possible TI.	.2 See chapter 13.

12 - 11 NOTES AND REMINDERS

11.1 Do not put sealant on the threads of connections, only on the outside of the connections.

11.2 Anytime you experience problems in the inital installation it is a good idea to remove all the extras, amplifiers, splitters, filters. Get a picture any picture then put these back in one at a time.

11.3 If you can not pick up a particular channel say # 16 move to a different satellite with the same polarity and try to tune in # 16. If you can it is not your system.

TERRESTIAL INTERFERENCE

This chapter will provide a way to determine if in fact your system is suffering from TI. You should be able to tell the strength and direction as well.
This is written in layman terms and will present a solution for mild, medium, and strong TI problems.

13 - 1 T WHAT???

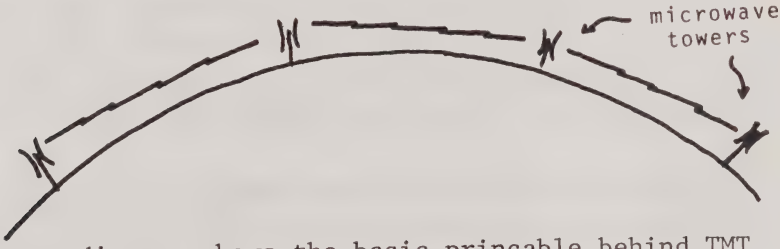
Do not adjust your set, you have just entered the TI zone unlike the twilight zone 10% to 20% of the earths TVRO's are affected by some degree of interference. Just because you are not affected tonight don't think for a minute this cancerous spread will not affect you tomorrow, like in the morning when you flip on Good Morning America.

Belive me, TI or terrestial interference is not magical nor extraterrestial, yes it may be mysterious we will give it that. If your trouble shooting guide looks worse in a week than your phone book does at the end of the year, you are probably not under self delusion. Yes, there is an explanation for having the wife and kids at the Hilton the last three days while the home intertainment center has been in a shambles.

For you brave souls who think you want to whip this monster on your own, here are a few suggestions. Make darn sure you have exausted all possibilities before you throw your hands up blurting out TI!! TI!!! Remember the reason you bought this manual was to save money.

13 - 2 The Untrained Eye

The difficulty of TI detection lies in 1. the inital install. 2. The untrained eye. In the inital installation because everything is new and therefore each components preformance must be proven to the untrained eye, and more often than not to the dealer as well. One cannot expect the dealer to exchange equipment without good reason.
A simple definition of TI is basicly any singnal that interfers with the one we want. However, it usually pertains to transcontinental microwave transmitters (TMT) for short. There are several other sources that will be discussed later.



The above diagram shows the basic princable behind TMT relaying the signal accross this country.
A good comparison to a relay map would be to look at any road map and pretend that each road is a path of destruction The point being made here is that there are as many or more routes for TMT as there is roads for your car. A relay map of the United States looks just like a road map, this is not saying these towers are built along side our roads, just that the maps look alike.

13 - 3 Testing For T I

Providing you are absolutly sure all the components are functioning properly, and you still have no picture or poor picture quality it is time to put on your hat that says "I have Patience" There are a few things we can do. So, you say you have nothing that even resembles a picture (so much snow and interference that you think you can make out a faint image) A. Call your doctor I mean dealer, ask him if he has some sixty and eighty MHz traps and a TI screen. In the event he says, Yes and the fee is under a $100.^{00}$ it may be less expensive, faster, etc., etc., to have a trained eye check it out. Option B. Read on.

13 - 4 Strength and Direction

One of the first things is to determine where the TI is in respect to, how much of the system is affected. Are all channels affected? Are all the satellites affected? (please jot this info down on paper) Is the TI stronger on one side of the satellite belt than the other? Jot it down. This will help to determine mild, medium, or strong TI levels.

Strong levels of TI may be expected when all channels on all satellites are in a blizard or worse condition. We might get another hint if you turned off the AFC on the receiver and adjust the fine tune on the TV and receiver, if the picture gets better or clears up, it could be a sign of mild TI.

There are as many combinations to this senario as the rubix cube. These terms, strong, mediun, and mild are only rough guidlines to determine what you are up against. The main difference between strong and mild is being able to

13 - 4 Strength and Direction Cont.

Distinguish an image on your TV. Obviusly if you can not distinguish anything on your TV you have a case of strong TI. Mild TI normaly does not affect majorities of channels or satellites, mild TI sometimes will show on the screen as an abnormal amount of sparklies and/or a horizontal block or bar that may or may not move slowly through the screen and again it may only happen during peak telephoning hours. Hows that for ifs, ands, and buts??

Strength and direction of TI can occasionally be determind by the assembly of a portable TI screen shown in fig 13-6 Move the screen around the dish, first one side then the other if the picture gets better, three cheers! it is a good feeling.
If no picture appears, it can be extremly difficult to tell if all the adjustments are in proper alignement when one has a TI problem. To help keep this as simple as possible hold the screen in several different positions then have a helper adjust all the variables, one at a time, write down each of the results.
Providing you do not have anything that you can call a picture at this point please consider these three options.

1. The dish is not aimed directly at a satellite.

2. Something in the inital trouble shooting was overlooked.

3. Strong TI

In the event it is 2. or 3. you may want to phone a qualified dealer.

13 - 4 Strength and Direction Cont.

But suppose it is number one, it sure would be nice to move the dish an inch or two one way or the other and have a good picture. In some rare cases things will check out in the inital installation, continue to work for awhile and and then right in the middle of your big TI investigation somthing decides to quit. Considering we didn'thave a picture to start with it may be difficult to tell that the LNA went to lunch, three minutes before you placed the screen in the right place to block the TI.

13 - 5 Trouble Shooting T I

On the brighter side lets assume you did receive a picture, only not the quality you expect. Remember those things called traps? Ok. but before we rush out and plunk down the bucks, let us tweak, tune, and peek out the system. It is essential to know what the TI screen is or is not doing for us. Dig out that piece or paper labeled TI from 13-4 and review the following ifs, ands, and buts.

IF THE SCREEN TOOK CARE OF ALL BUT A FEW SPARKLIES ON BOTH POLARITIES:

Install a TI screen permenantly and retune. The larger screen may provide a picture you can live with.

THE SCREEN HAS DONE WELL BUT STILL LEFT A LOT OF SPARKLIES ON BOTH POLARITIES:

Install screen permenantly and retune. It may be time to consider the purchase of the I F traps one at 60 MHz and one at 80 MHz.

13 - 5 Trouble Shooting T I Cont.

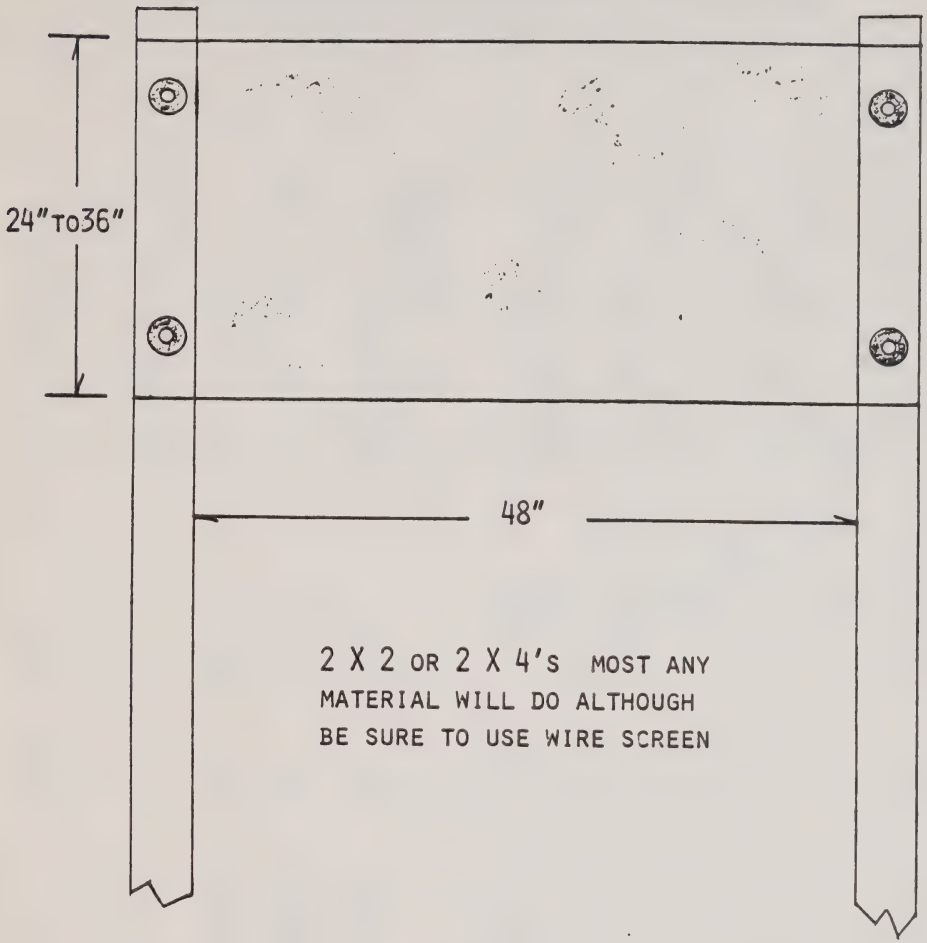
SAME AS ABOVE ONLY ON ONE POLARITY:

You will only need one I F trap, that would be a 60MHz for odd channel interference, and an 80 MHz for even channel enterference. (For Satcom, Comstar type birds)

IF THE SCREEN ENABLES YOU TO MAKE OUT AN IMAGE, BUT THERE IS STILL A TREMENDOUS AMOUNT OF SPARKLIES.

Install screen, retune with, and without the AFC on. Consider the purchase of the 60 and/or 80 MHz traps. You may also have someone out to hook them up if they work buy them, if not pay for the service call and review the options below;

1. Move the dish out of the T I path.
2. Return the dish for a refund or sell it.
3. Check with a company that specializes in T I.



2 X 2 OR 2 X 4'S MOST ANY
MATERIAL WILL DO ALTHOUGH
BE SURE TO USE WIRE SCREEN

13 - 6
TI SCREEN

NAME	TYPE	ISSUES	PRICE	WHERE TO ORDER
GALAXY ONE MAGAZINE	PROGRAMMING GUIDE	N/A	29.00	UNIVERSITY GRAPHICS P.O. BOX 1338 ENGLEWOOD, CO. 80150
CHANNEL GUIDE	PROGRAMMING	52	39.00	SAME AS ABOVE
ORBIT	PROGRAMMING	12	48.00	1 - 800 - 792 - 5541
SATELLITE TV WEEK	PROGRAMMING	52	48.00	SATELLITE TV WEEK P.O. BOX 308 FORTUNA, CA. 95540 1 - 800 - 358 - 9997
DISH	PROGRAMMING	26		DISH P.O. BOX 8 MEMPHIS, TN. 38101
ON SAT	PROGRAMMING	52	39.00	S T V. P.O. BOX 2347 SHELBY, NC. 28150 1 - 800 - 438 - 2020
SATELLITE DEALER	TRADE MAG.	12	36.00	SATELLITE DEALER P.O. BOX 1700 HAILEY, IDAHO. 83333
SATELLITE BUSINESS	TRADE NEWSPAPER	12	36.00	1 - 800 - 523 - 5533
SATELLITE T.V. OPPORTUNITIES	TRADE MAG	12		SATELLITE TV OPPORTUNITIES 1733 EAST UNIVERSITY AVE. OXFORD, MS. 38655

PRE- NOT FOR SALE COPY

NAME	TYPE	ISSUES	PRICE	WHERE TO ORDER
S T V.	CONSUMER	12	19.95	SATELLITE TV MAGIZINE P.O. BOX 2384 SHELBY, NC. 28151-2384
HIDDEN SIGNALS WHERE TO FIND THEM	BOOK	N/A	16.70	THE BOTTEM LINE 2701 W. DUNLAP SUITE 150 PHOENIX, AZ. 85021
THE WORLD OF SATELLITE T V	BOOK	N/A	12.00	SAME AS ABOVE
THE DOWN TO EARTH GUIDE TO SATELLITE T V	BOOK	N/A	9.00	SAME AS ABOVE
SATELLITE SURVIVAL	BOOK	N/A	15.00	SAME AS ABOVE

*ALL PRICES INCLUDE POSTAGE 4TH CLASS.ADD 1.00 FOR 1ST CLASS.